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Telephony.

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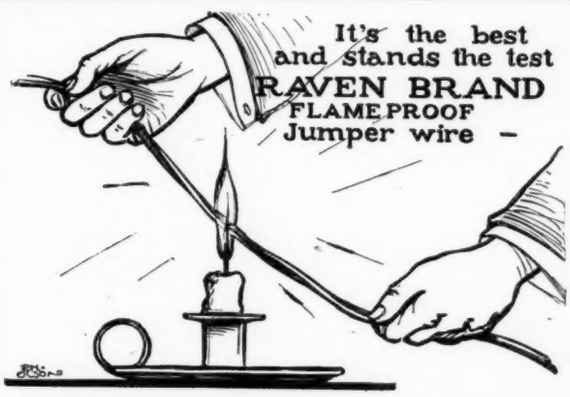

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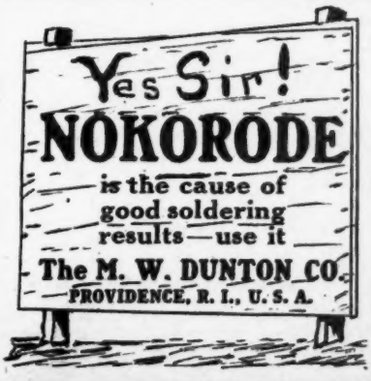

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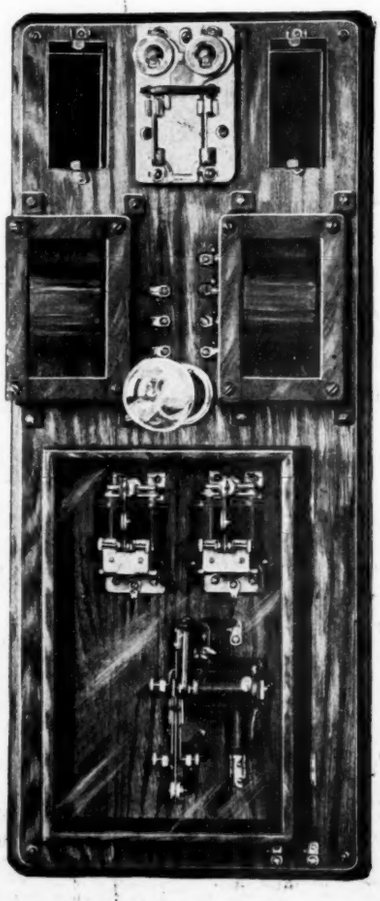

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THE AMERICAN TELEPHONE JOURNAL

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CULTIVATE THESE FOUR HABITS.

The "Four Habits" which go to the making of a Good American Citizen are:

The Health Habit; the Work Habit; the Study Habit; and the Play Habit.—Dr. Wilber E. Post.

Some Good Habits.

From all parts of the country come reports of great numbers of people suffering from attacks of the grippe which, for the first time in a number of years, is epidemic in this country. The forces of all businesses are suffering from this epidemic and telephone companies are no exceptions.

The health commissioner of Chicago, John Dill Robertson, states that persons who have formed the health habit are practically immune from the grippe and other illnesses.

The larger telephone companies, a number of years ago, recognized the value of exercise, ventilation and proper food as a means of keeping the operators in good health, thus enabling them to work at maximum efficiency. Individuals are now learning that five minutes spent in simple exercises in the morning upon rising and a corresponding period at night, will accomplish wonders for them.

These exercises, combined with the proper amount and kinds of foods, have enabled them to perform their work with unabated vigor from day to day. In other words, in forming the health habit, they have also formed the work habit. This in turn creates a tendency for the study habit, while the health habit naturally will also tend towards inducing the play habit, thus giving a sound mind in a healthy body.

The Telephone as a Credit Builder.

A telephone in the house is now considered in many cases the basis for extending credit to the family or individual who is paying for telephone service. To cite only one of many examples, Chicago daily newspapers accept classified advertisements telephoned their offices. They are willing to insert them and send the bill to the advertiser.

This is a tribute to the telephone. It takes for granted that the man who has a telephone pays his bills and is worthy of trust. If the same man walked into the counting room of a metropolitan daily and personally presented his "ad" he would have to produce the cash to secure its insertion in nine cases out of ten.

When the European war broke out a year ago, many American travelers were left stranded abroad. They could not change their letters of credit for gold, and gold was the only medium accepted in many of the cities in the war zone. Many well-to-do people actually suffered for lack of food and lodging during the stringency. The United States government came to the rescue, and advanced gold to several hundred tourists who agreed to repay the money.

There are 112 Chicagoans who have failed to reimburse "Uncle Sam" for funds so advanced, and the Chicago Herald, in an editorial commenting on the matter, entitled "A Tour or a Telephone?" says:

"Travel in Europe is usually classed among 'luxuries' by Americans. Having a telephone in your house, or place of business, or both, is not usually so classed; certainly not in Chicago. However, facts have come to light which seem to compel a revision of these opinions.

There's the list of defaulters on their promises to refund money charitably advanced by their government to citizens 'stranded' in Europe by the war. Of these, 112 gave Chicago addresses. They got all the way from $1 to $540. Not one of them can be found in the telephone directory."

What is the answer? The 112 defaulters—not to say "deadbeats"—have no telephones. This instance seems to strengthen the theory that the man with a telephone in his house is usually good credit.

Operating companies may have trouble collecting from slow subscribers, but the fact remains that the installation of a telephone may be considered a preliminary step to building up one's financial standing.

It Can Be Done

By HERBERT KAUFMAN

A Viennese surgeon doses his patients with morphine, makes a local injection of stovaine and eliminates the dangers which frequently attend operations in which ether and chloroform are employed.

A French scientist has invented a lens which magnifies light a thousand-fold so that 100 times less current is required to produce the illumination of an ordinary incandescent lamp and sufficient motive power furnished by a jet of water or a squirrel turning in his cage.

Physicians now know that the removal of certain organs will correct gland diseases whose relation to the excised parts was formerly unsuspected. The deadly venom of the rattlesnake has disclosed itself as a corrective agent for epilepsy. A group of eminent alienists has concluded that insanity is as frequently caused by the conditions in which the unfortunate has lived as it is as the result of intrinsic defects in the individual.

The distinguished president of a British association of science has presented indubitable evidence in support of his theory that the chemical purity of air is of itself non-essential from the standpoint of health.

We've put the past on the witness stand and the engineer, the scientist, the doctor, the chemist are cross-examining yesterday. We're not content to accept the verdicts of our predecessors—we refuse to acknowledge their unverified decisions as the last word. Humanity is fighting for the truth.

We believe that there's a cure for every ill, a remedy for every evil, a solution for every problem, an answer to every riddle. Fatalism is an absolute creed. We no longer lie supine before our woes and our ills. We are battling for freedom from bigotry and parasite and crime and darkness and ailment.

We can do it; there's always a way when determination and imagination strive for betterment. The rainbow makers are at their tasks; every dawn is painted with another proclamation of advancement.

There are no "necessary evils"; there are no mortal afflictions; there are no unescapable wastes and leakages. Intelligence and efficiency cannot contemplate the passive acceptance of foulness and inferiority. The information that yesterday gave us is founded upon a hodge-podge of guesses and carelessness—upon ideas and ideals which the 20th century has outgrown.

There is hope for all who suffer—opportunity for all who deeply think—chance for all who dare to challenge precedent. We are moving on and upward, climbing to a greater civilization, advancing toward a cleaner and safer and sweeter existence.

The years of mystery are behind us—the great epoch of revelation has come. You can make of yourself and for yourself anything to which you set yourself.

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The Cable Bug and Its Ravages in Southern California

A Species of Beetle Which Bores Holes in Lead Sheathing of Telephone Cable During Dry Season, Causing Trouble in the Wet Weather—Paper Presented at San Francisco Convention of Independent Telephone Association of America

By Albert Schuler

Among the first duties assigned to me when I started in the telephone business about 20 years ago, was the digging of a hole. I was furnished with a crow bar about six feet long and about as big around as my wrist—a great deal taller than I was and very heavy—and told how broad across the hole should be and how deep. Looking at the bar and the shovel and the spoon and the ground, I said to myself: "If this is part of my duties, all right." And I finally got the hole dug.

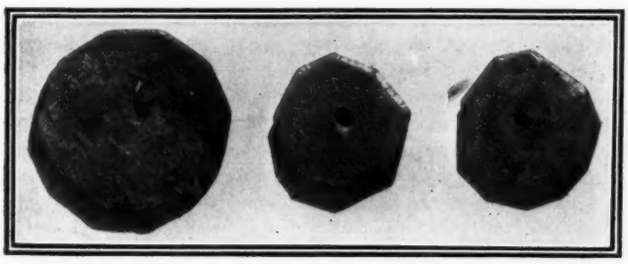
Later on I was sent out to install a telephone. This happened to be at the home of my Sunday school teacher. During the installation of that telephone she said to me: "Albert, what makes that telephone talk?" I scratched my head a minute and studied. I did not want to display my ignorance, so I answered: "The batteries."

I then concluded that the best thing for me to do was to go back and find out what made the telephone talk. So I went back to the manager and asked him what makes the telephone talk. He was about as ignorant on the subject as I was and answered: "I don't know."

"Where can I get hold of a book that will tell me?" I asked. He named a book that he thought might contain the information I desired. I got the book and studied it, finding out to my satisfaction, at least, what made a telephone talk.

I kept on in the telephone business and finally got to shooting special troubles with the Bell people. After two or three men had been sent out to locate a case of trouble and did not find it, I was sent out. Ordinarily I succeeded in finding what was the trouble and how to eliminate that particular case.

Five years ago the first of February, I went to Santa Barbara as general manager of the Home Telephone & Telegraph Co., of Santa Barbara, and the Home Telephone & Telegraph Co., of Santa Barbra county. We have there nine exchanges. We have a good many thousand feet of lead armored, aerial telephone cable. The winter rains had been delayed and we had a few sprinkles and a few showers and numberless cases of troubles. Shortly after I came to Santa Barbara, we had what they call a good genuine California rain. It started in to sprinkle and got to raining and kept on raining and raining, until the first thing we knew, instead of having 5,000 telephones in operation, we had about eight or nine hundred that were not in operation.



Pieces of Lead Sheath Showing Holes Drilled by Cable Bugs.

I began to wonder what on earth was the matter and wishing I had stayed in San Francisco,. I asked the troublemen what was the cause of all this trouble. They informed me there were little holes, about a sixteenth of an inch in diameter, in the armor of the cable. "We do not know how those holes got in there," they said, "but we call them bug holes." We found several hundred of these holes through the armor of the cable. Of course, when it rained the water could not help but get into the little holes.

Well, whether these were bug holes or not, was a question no one seemed able to answer. I said to the men: "If they are bug holes, go out and catch some of the bugs. Put them in a lead box and then we can see if they are bug holes. If any of you can catch one of those bugs and put it in a lead box and it drills its way out, I will concede that these are bug holes."

The Cable Bug (Sinoxylon Declive) Many Times Enlarged.

I took a galvanometer and voltmeter and made examination for electrolysis. Some one suggested that it was electrolysis caused by current discharging from the cable leading off into the earth and back to the street railway station. We did a little bonding and then we did a little more bonding, and yet more bonding, but the bug holes kept increasing from year to year. That was five years ago. In February of this year, they became so numerous that I concluded I would devote a certain amount of time every day in the endeavor to capture a bug—and I did.

The third day that I started out, I said to the cableman: "The reason you men do not find these bugs is because you ride along the cable on your cable cars. When you jar the cable, you jar the bug off of the cable, or the bug gets scared and flies away—one of the two."

We secured an expert who assisted us in making electrical investigations on our cables and we decided that there was no electrical condition on our cables to cause these holes. But notwithstanding that, we considered it advisable to carry a heavy copper wire from the lower end of town across from our cables to the negative busbar of the street railway and power station and bonded all our cables to this.

Some of the prominent engineers said: "Now that you have done that, you won't have any more trouble." The next week we found several new holes in the Pacific company's cables. It looked as though we had caused more holes instead of less holes by bonding our cables.

Shortly afterwards, in March, we finished up the entire bonding of all our cables. In April we made an inspection and as we could find no bug holes, we concluded that possibly the bonding had done some good. In May we made another inspection of our cables and could still find no electrical conditions, and neither could we find any bug holes.

In June, July and August, we made continued inspections, and in August we found numerous bug holes. In September I sent a young man out riding the cable together with two cable men. We made an inspection of over 40,000 feet of our cable armors. In that 40,000 feet of cable armor we found something like 50 of these holes, notwithstanding the fact that we had bonded and grounded our cables to the best of our

ability, and through the advice of an expect electrical engineer.

I took the matter up with the Standard Underground Cable Co., of Pittsburgh; Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y.; John A. Roebling's Sons' Co., of Los Angeles, but none of these companies could give me anything definite as to what caused these holes. Their experiences were as varied as the rest of us. About the middle of September, I told the cablemen and troublemen that we must do something. We must find some of those bugs, I said, and find out whether there are any that can drill a hole through the cable. And I sent some of the men out to capture some of the bugs.

We made a lead box with a glass cover so that we could watch the bugs at work, if we succeeded in getting any. The second day one of the men came back with two bugs in the box. He discovered numerous bugs, but as soon as he tried to catch them, they would fly away. We put the two bugs he captured in the lead box and placed a lead band over them, so they could not get away unless they drilled a hole through the box. The following day we took the cover off the box and placed the bugs in another box. Then the first box was held over a piece of paper and jarred. We immediately noticed numerous small particles of lead and we could see where the bugs had chiselled around the box. The third day after we had put these bugs in this box, they died.

So we went out again on a bug-hunting expedition, capturing five bugs. We put the five bugs in the lead box and they became exceedingly lively in trying to see which one could run around the fastest or fly across the box the quickest. The bugs have a hard shell and when they lift that hard shell up, they extend a pair of wings. They could fly across the space of the box which was only two inches across and half an inch deep.

We noticed in the morning when we came to the office that the bugs would be rather inactive. But as soon as we handled the box a while and began to get it warm, they began to liven up. So I said: "If they want to get livened up, we will warm them up."

We first placed the box in a glass jar, so that if they got through the lead box, they would not get away, and then set

The Santa Barbara Bug-Hunting Gang.

the glass jar in the sun. About that time some one wanted me on long distance and I had to leave the box. When I returned the bugs were dead. We were then obliged to go on another bug-hunting expedition. We made another box, this time with a brass plug, so that we could put the bugs in through the hole, and close it up by putting in the brass plug. We made numerous air holes in it. Two weeks ago, today, we placed two of the bugs in this box. One of the bugs immediately started to drill a hole through the brass plug. The bug, in three days' time, drilled through the box and came out on the

Members of Trouble Department of the Santa Barbara Company.

side against the brass plug. When he came to the brass button, he evidently concluded he did not want to go farther. The other bug had also started to drill a hole. En route to this convention, the bugs were left in my machine, and as it was freezing weather one night, they evidently froze to death, for the next morning they were both dead.

I sent one of these bugs to C. M. Beers, the horticultural commissioner at Santa Barbara. He in turn sent it to H. J. Quayle, the entomologist at Riverside, who sent it to Dr. Van Dyke at Berkeley. Mr. Quayle's letter is as follows:

I am in receipt of your favor of the 20th, together with specimen of beetle boring into lead cable. I have sent this to Dr. Van Dyke, the specialist at Berkeley, who has identified the insect as *sinoxylon declive*. This insect ordinarily attacks wood, particularly live oak, or cord wood. Their habit of boring into the lead seems to be simply one for concealment. Such beetles have been reported from time to time from different sections of the country. Your observations on this bettle are interesting and elucidating.

Similar holes to the ones that the bugs drilled in those boxes were found ten years ago in South Bend, Ind., by Earl Hopkins. They were found nine years ago at Rockford, Ill., by William Lehman, and also at Omaha, Neb., by Mr. Betz. In recent years they have been found at Seattle, Tacoma, Portland and all down the coast as far as San Diego. They have also been found in Florida, and a prominent engineer, in making an address before the electrical convention in Boston several years ago, alluded to them as the "Australian cable bug."

Numbers of them have been found in old lead foil of tea packages, and it is suspected that the family is of Oriental extraction. At the present time these bugs are costing our company in Santa Barbara county between $300 and $500 a month, and we do not know what to do to stop their action. I would be only too glad if some of these engineers who say it is electrolysis will tell us how to further bond and protect our cable from electrical action that is produced by a bug which we can put in a box and which can drill itself out and fly away.

The members of the bug-hunting gang, pictured in the accompanying illustration, are from left to right as follows: Albert Schuler, general manager; F. H. Russell, wire chief; Wm. Lehman, E. E. Betz and E. M. Hopkins,

cable splicers. Wm. Lehman was the man who caught the first bug. Another illustration which shows the bugs is made from photographs many times the actual size of the bugs. The bug in the middle is about 20 times its actual size.

The holes drilled in the cable sheath by the bugs may be seen in one of the illustrations, the reproduction being of the actual size. The three holes shown are bored at an angle.

Tests of the Thermophone in London.

According to the Electrician, of London, it is understood that the British postoffice is investigating the Thermophone, invented by M. de Lange, and has ordered a dozen telephones for its research department, so that life tests may be made.

Among the points that at once arise in connection with this instrument are the possibility of fusion of the wire, and the question whether the instrument is fragile. In regard to the first point, James Swinburne has reported that, after testing some of the telephones for speaking, the current was then increased to the fusing point. One telephone required an increase of 115 per cent., another 67 per cent., and a third 70 per cent. to cause fusion. As the resistance of the wire rises on heating, this means a very large margin of power, and shows that on circuits of small resistance the instruments largely protect themselves, taking something in the neighborhood of four to eight times the speaking electric power to cause fusion.

With regard to the question of fragility. W. Llewellyn Preece has tested one of the telephones by dropping it down a flight of stairs. After this treatment it was as serviceable as before, so that it cannot in any way be considered as delicate. Mr. Preece points out that, although the telephone is not yet suitable for long distance telephony, the instrument is a distinct improvement on the magnetic telephone where the distances are short, as in houses, ships or aeroplanes, owing to the greater clearness of the speech, excellent articulation and an ample volume of sound.

M. de Lange has now produced small portable sets for the use of deaf people, and recently gave a demonstration of the uses of the Thermophone for such purposes before the Council of the Otological Section of the Royal Society of Medicine.

Los Angeles Home Company Increases Its Dividend.

With the recent action of the directors of the Home Telephone & Telegraph Co., of Los Angeles, Cal., in declaring a 1¼ per cent. greater dividend on the preferred stock of that company, payable on the last day of 1915, this stock is restored to a 5 per cent. basis.

For some years past, the demand for extensions of the company's facilities to cope with the enlargement of the city's boundary has been very great and practically all surplus earnings have been used for financing these additions. This has very substantially added to the value of the securities, so much so in fact that the stock is selling today at practically three times the price quoted a year ago.

With the definite limitation of the city to its present area the need for cable extensions is greatly diminished and the earnings will henceforth be available for dividend purposes.

Investigation of Extension Telephones in Massachusetts

Hearing Held by the Massachusetts Public Service Commission by an Order of the Last Legislature to Determine Whether the Existing Rates for Extension Telephone Service Are Reasonable and Satisfactory—Interesting Testimony Presented]

An interesting and important hearing was given by the Massachusetts Public Service Commission at Boston, on December 30, upon extension telephone service, by an order of the last legislature requiring the board to determine whether existing charges are satisfactory. Senator Julius Garst, of Worcester, led the advance against present rates and Vice-President E. K. Hall of the New England Telephone & Telegraph Co. was in charge of the defense. Representatives of Independent manufacturing and telephone interests also took part in the hearing.

In opening the hearing, Chairman McLeod said that in previous conferences the interested parties had conceded that no legislation relative to a change in extension telephone rates appears necessary at present, but that the commission has full authority to consider the existing rates. Senator Garst then took the floor, setting forth the contention that the New England company appears to base the extension set rate on the value of the service to the subscriber instead of on the cost of such service. The speaker urged that the actual cost of extension service should be the test of rates. The important points, he held, are the investment outlay and the expense of maintenance. Some increase in service does not necessarily imply an increase in cost, the peak load at the telephone exchange being but little increased by the use of extension instruments.

Chairman McLeod remarked that a recent supreme court decision indicated that whenever a particular service is added it should bear its proportion of general charges. Senator Garst further said that the present arrangement is an infringement of individual rights, especially in view of the ability of individuals to purchase instruments in the open market. Upon inquiry, the speaker said that the company tends to secure a larger use of its facilities where extension sets are installed.

C. H. Porter, Newton, Mass., stated that he was paying $6 a year for the use of an extension set at his residence. He said that this actually tends to improve the company's service, since it results in quicker responses to calls and thus reduces the time an operator is obliged to put on a given connection. Interest, depreciation and directories, the speaker contended, are the only costs which the company should consider in making rates for this class of service. Repairs are trifling and the present charge, the speaker held, is out of proportion to the necessities.

Clarence C. Colby, sales manager of the Samson Electric Co., Canton, Mass., said that his concern has been manufacturing telephone equipment for 25 years, specializing in apartment house, hotel, mill and school interior systems. Owing to the refusal of the New England company to permit connection of these sets to its outside system, the business of the Samson company has been reduced 90 per cent. He said:

"We find the Western Electric Co.'s apparatus going into apartment houses and accepted for connections outside, which makes it almost impossible for us to compete in this line of business. Take the case of a Western city in which the Bell system's wires are run to the apartment house vestibule, with a key switch permitting connection of the local telephone to

either the outside service or to the apartments and Western Electric apparatus within the suites. This kind of installation, if carried all over the country, would simply put the Independent manufacturers out of business. The public naturally prefers a system of interior telephones which can be connected with the outside lines. This commission might well consider whether it would not be a public benefit to allow the use of telephones purchased in the open market on interior systems which must be connected with the outside service on demand. One of the most important results of such a policy would undoubtedly be the lowering of the cost of installations of this type. I am sure that instruments could be sold at a good profit at from $4 to $5 a set and with few repairs last from 5 to 10 years."

Good Apparatus Made by Independent Manufacturers.

Mr. Colby said there is absolutely no question that Independent manufacturers can produce as good telephone sets as the Western Electric Co.; that it is merely a question of good electrical engineering, and so much steel, copper wire and other materials. "There is nothing mysterious about a modern telephone set," he said. "The commission should consider if the time has not come to standardize all telephone sets irrespective of make, so that all first class equipment for interior installations can be connected with outside systems. We do the same thing with electric lights and gas in our homes and should have the same right with our telephones.

"We purchase desk sets from the Western Electric Co. because they make millions to our ten, and consequently can produce them cheaper. Our own market has been virtually killed by the policy of the Bell companies. We put the desk sets which we buy, into apartment houses and mills where outside connections are required, the equipment being sold outright to the owner, who thus becomes responsible for the maintenance of the interior apparatus."

Arthur A. Noel, superintendent of the Automatic Telephone Co., New Bedford, Mass., opposed any reduction in the extension set rate, stating that the extension instruments cost more than do those used in a manual system, and that the company would find it difficult to meet the cost of such service if the charges should be lowered by the commission. These telephone sets, he said, cost $12.50 apiece, and are purchased from the Automatic Electric Co., of Chicago. The apparatus is a specialized product from start to finish.

All the company's New Bedford service is unlimited and no profit is figured on the extension service, which is given almost entirely to accommodate the subscribers. The extension set increase the use of the service anywhere from 50 per cent., in some cases to the point where the extension equipment is used more than the original telephone. A rough average increase in service resulting from extension sets would be 15 per cent. New Bedford rates on extension sets are $9 a year for a business instrument and $6 for residences.

Edward K. Hall, vice-president of the New England company, was the last speaker. Replying to a statement injected by Miss E. Touissant, of Brookline, Mass., relative to working conditions, Mr. Hall said that no class of women indoor workers in Massachusetts is employed under better conditions than the operators of the telephone company. The speaker also said that the sanitary aspects of the telephone transmitter and receiver have been approved by the best medical authorities after exhaustive research. The average term of service of operators in the New England company is now from 4 to 5 years. A very large percentage leave to get married.

Turning to the main issue of the hearing, Mr. Hall said that it is impracticable to take a single rate out of a general schedule and adjudicate it by itself. He felt that the commission ought not to change the extension set rate without considering the company's entire schedule of rates. The charge throughout the state for these sets is $6 per year each, except in unlimited business service in the heart of Boston where the rate on extension instruments is $9 per year. If the rate should be based wholly on local costs, a large emergency use of this class of service might be done away with. To attempt to base the rate purely on cost would lead to constant complication and embarrassment. Seven million dollars' worth of subscribers' station equipment is carried by the company, and the extension set is a part of this which properly needs to be considered as an integral portion of a correlated system and not segregated for rate-making purposes by the purely local conditions of individual subscribers.

Mr. Hall said that there is no question that good apparatus is today being manufactured by Independent factories, suitable in particular for local operation and for a moderate distance service, but that in thoroughness of detail and adaptability to the conditions of long distance operation, the speaker felt that the use of the single product of the Western Electric Co. insured the best all-around service. From this point of view the installation of instruments freely by outside parties would be certain to impair the service, and so long as the company is responsible for the service it should have the right to control it. Only one case came to his recollection in New England where outside instruments were connected to the system in any number, and that was at Worcester, Mass., about 20 years ago. The resulting troubles noted in the service led to an investigation and to the removal of about 30 non-standard instruments.

Comparison with Other Utilities, Unfair.

Mr. Hall said that no fair comparison can be made between the customer's viewpoint relative to gas, electric lighting and telephone service. In the two former cases quality of the local supply and the reasonableness of the charge are the two essential points, whereas in the latter instance, the maintenance of the same quality of service all over the telephone system is vital to successful operation. There are over 100,000 extension sets in Massachusetts, of which 39,000 are single telephone extensions and the remainder in private branch exchange installations. From a rate of $18 per extension set per year in vogue not many years ago, the rates have dropped to $9 and $6 as previously stated. The reduction of two years ago to the uniform $6 rate (with the Boston business service exception) meant a reduction in revenue of $100,000 a year.

Any surplus revenue which the company might earn, Mr. Hall said, could be better put into other changes than in reducing the rate on extension equipment. The $6 rate is the minimum, on the whole, the country over. The speaker knew of no large company having a rate of less than $6 and in fact cited rates of $12, $9 and $7.20 as examples of higher charges in other places. A few farmers' lines in Wisconsin are provided with extension sets at $3 a year, but the range and value of the service is, of course, far less than in the New England system.

The New York Telephone Co. has a rate of $6 per set in certain large private branch exchanges, with a rate of $4.80 after a stated minimum is exceeded. All these are on measured service contracts. It is the general custom to make the rate the same in subsequent years as in the first. Many state commissions have approved telephone schedules containing extension rates of from $6 to $12, and the New York and Nevada commissions have specifically approved the $6 rate.

The annual average cost of maintaining service with an extension set on the New England system, Mr. Hall said, ranges from $6.75 to $7, according to the best estimates which the company's engineers have been able to prepare. It is recognized that close figures cannot be assembled on this subject, but to the company's best knowledge, this is the final result of the most competent study. Itemized, it comes to $3.24 per year for annual charges; $2.01 for annual traffic expense; $0.75 for commercial department expense; $0.34 for general cost; and $0.55

for interest, making a total of $6.89. These figures are made up of the following details:

Investment, exclusive of transmitter, receiver and induction coil, which are leased from the Bell organization, $6.99. This is composed of apparatus, including cord, $4.49; miscellaneous material, including wiring, insulation, etc., $0.79; voucher expense, $0.06; labor, including proportional part of dead time, rainy days, etc., $1.65.

TOTAL FIRST COST.		
Proportional part of supply department cost		$0.02
Tools, vehicles, etc		.11
Working capital		.80
Total		$0.93
Add first cost		6.99
Total		$7.92
ANNUAL CHARGES.		
Subscribers' station repairs	$1.10	
Substation changes and removals	.82	
Depreciation 10 per cent	.45	
Lease, transmitter, receiver and induction coil	.75	
Taxes	.12	
		$3.24
COMMERCIAL DEPARTMENT COST.		
Directory	$0.34	
Administration (accounting, collecting, canvassing, advertising)	.41	
		.75
TRAFFIC DEPARTMENT COST.		
One-fourth operating room cost per regular station, per year		1.62
Superintendence, inspection, traffic on basis of 18.4 per cent. of above	.30	
Cost of power (one-fourth of $0.36)	.09	
		2.01
General expense	$0.34	
Interest, 7 per cent. on $7.92	.55	
		.89
Grand total per year, per extension set		$6.89

In closing, Mr. Hall reiterated his belief that the extension-set rate should not be altered by itself. He stated that if a change were to be made, it would be logical to increase the rate on sets in flat rate stations and to lower it in measured service installations. On the whole, he concluded, extension service is chiefly a benefit to the subscriber, although it helps to improve the company's operating conditions.

Wood Preservers' Convention.

The twelfth annual convention of the American Wood Preservers' Association will be held at Hotel Sherman, Chicago, January 18, 19 and 20, 1916. Delegates from the United States and Canada will attend, and it is expected many outsiders will be drawn to the convention by reason of their interest in the conservation of our forest resources and the economic utilization of wood.

The effect of the European War on the American timber treating industry will be discussed from the viewpoint of importers of creosote oil and users of this important wood preservative, as well as by representatives of American manufacturers of wood preservatives. The domestic production of zinc chloride and other wood preservatives has largely increased in the face of a falling off of 22½ per cent. to 37,828,646 gallons in imports of creosote in the last fiscal year. Germany and Great Britain have been furnishing the bulk of these creosote imports, and those from Germany especially show the largest decrease, because there is an embargo on these exports and an increased local demand for creosote as fuel in Germany.

The railroads are the largest users of treated wood for cross ties, timber and piling. Municipalities are beginning to appreciate the merits of treated wood block as a paving material. Telephone and telegraph companies are using more treated poles and cross arms. More factories are laying treated wood block floors, because they are noiseless, clean and durable. In short, treated wood is receiving increased favor everywhere. By protecting wood from decay at a comparatively small cost for chemical treatment, it is possible to greatly lengthen the life of the timber which makes treated wood a cheaper material to use in the long run than either untreated wood or its substitutes.

The membership of the American Wood Preservers' Association is widely scattered geographically, and includes residents of the United States, Canada, Europe and Asia. The membership consists of treating plant managers, consulting and treating engineers and chemists, foresters, city engineers, railroad men, manufacturers of machinery and supplies, and many others who are interested in the conservation of our natural resources. This gives the association a wider public interest than is ordinarily looked for in a technical organization.

New Automatic Exchange in Service at Alliance, Ohio.

The new automatic exchange of the Ohio State Telephone Co., at Alliance, Ohio, was recently placed in service, and the equipment is said to be working satisfactorily. The installation of the automatic equipment began in August after the merger of the Stark County Telephone Co. with the Ohio State company.

The equipment occupies the third floor of a new building on Main street, especially designed for the use of the telephone company. The offices of Manager C. S. Swift are located on the second floor.

G. R. Johnston, vice-president; R. R. Stevens, general commercial superintendent; B. H. Brooks, chief engineer, and other officials of the Ohio State Telephone Co., of Columbus, together with George King, general manager of the Youngstown branch of the company; C. J. Queen, of Akron; Delbert Graham, of Canton, district manager; C. S. Swift, local manager of the company, and M. D. Evans and Roy Owens, of Chicago, representing the Automatic Electric Co., were present, together with a number of invited citizens and those having charge of the building of the new system.

It was 10 o'clock in the evening when the cut over was made, and this became a proud moment for the builders of the automatic system. The work required but a few minutes as everything was in readiness for the event and worked perfectly.

The first message sent over the automatic system was that of the president of the chamber of commerce, Col. W. H. Morgan, to Mayor W. P. Barnum.

M. J. Beaton was engineer in charge of the work of installing the new system. M. Keethler was superintendent of construction and C. Merrill, George Painter and John Love, assistants. To these men is largely due the credit of the success of the change. The cost of the new system is about $110,000.

The cities in Ohio now equipped with the automatic system are: Dayton, Columbus, Akron, Kenton, Newark, Zanesville, Washington C. H., Bucyrus, Van Wert, St. Marys, Cambridge and Alliance.

Improvements to Cable System at Waukegan, Ill.

The Chicago Telephone Co. is engaged in making improvements which will aggregate between $40,000 and $50,000. Practically all of these improvements are being made in Waukegan, the work dealing principally with the elimination of overhead wires and the installation of cables.

One of the large cables will extend from the company's office in Waukegan to Broadway, in North Chicago. The rest of the work will be done in the city of Waukegan.

These improvements are made necessary by the growing population and increased demands for service. There are now over 3,000 telephones in Waukegan and North Chicago.

Fundamental Principles of the Telephone Business

A Reading Course Designed to Present Logically the Principles Which Underlie Successful Organization and Operation of Telephone Properties—Prepared Under the General Supervision of Stanley R. Edwards—Part I, Telephone Economics, by James H. Shoemaker, Completed June 26, 1915—Part II, The Corporate Telephone Organization, by J. C. Kelsey and S. R. Edwards, Completed September 25 Part III, Telephone Accounting and Auditing, Written by James H. Shoemaker

Quiz Questions on the Preceding Installment.

100. What question relative to a reserve or surplus, not in cash, do stockholders and directors ask?

101. Explain why money may be borrowed, or additional stock sold, to replace cash taken from earnings and spent in plant extensions.

102. What entries should have been made on the books in the case under consideration in order to obtain the "Reserve for Accrued Depreciation"?

103. What procedure should be followed in order to show the real plant value on the books and thus avoid a book value of less than the plant is plainly worth?

104. Outline a method for the division of the increased plant value, due to extensions, between reserve and surplus.

105. Outline the method followed by the officials of a telephone company in an effort to anticipate the total of the inventory.

106. What item appears on the liability side of the balance sheet for the first time? What items on the balance sheet worried the bookeeper and manager?

107. If commissions do not allow for the expense of learning the business, what can stockholders do? What fact as to building a plant can not be contradicted?

108. What arguments are used to point out why a telephone company should be allowed the cost of learning the business?

109. Outline a policy for overcoming the suspicion of stockholders as to reserves that are not in cash.

CHAPTER X. Auditing.

110. *Various Views of Audits.*—Some employes look upon an audit as though it were an indictment or accusation from their employers. Certain employers look upon it as an extreme to be resorted to only when they wish to convict or incriminate employes. A few auditors, themselves, have looked upon an audit as an occasion for finding fault—as the only means of proving that they had earned their pay. It is fortunate that all three of these classes are growing smaller from day to day.

111. *The Modern Idea of an Audit.*—The modern view of an audit is more like the modern view concerning other things now known to be necessities, which, only a few years ago, were looked upon as unwarranted expenses or unpardonable luxuries. The writer remembers well when many business institutions looked upon a writing machine as an unwarranted expense. Later, agents for adding machines were told that they were endeavoring to unload an unnecessary expense upon a business whenever they attempted to sell their product. It is only a short time since the cash register, which is now in the cross-roads grocery, was looked upon as an expense rather than an economy.

It is since the year 1900 that plenty of light, plenty of elbow room and plenty of fresh air and well regulated temperature have become generally recognized as economies, when furnished for employes. In some instances the directors of telephone companies, even yet, object to furnishing power and electric fans to insure comfort on hot days for operators and other "inside" help.

In a preceding chapter it was suggested that, to be reliable, an accounting system must include the filing of a voucher, or its equivalent, covering every item among the revenues received as well as a voucher for every item paid out. It is upon that same principle that the regular audit is coming to be recognized as a necessity and an economy, rather than a luxury or expense.

112. *The Main Purpose of the Modern Audit.*—The vouchering of every item of income and outgo has a tremendously stimulating effect for good, in numerous well known directions. In like manner the knowledge that there is to be a regularly timed audit or as in the case of the "calls" for the reports of the national banks, an audit at some uncertain date within a given period, has an equally strong influence for good, all along the line.

It is this maintenance of a high standard of general dependability, in the accounting branch of a business, that should be aimed at in arranging for an audit. And this high standard of dependability cannot be as well maintained as it otherwise might be unless the periodical audit, by some outside auditor, is definitely established as a practice of the institution—as definitely established as the depositing of its funds in a bank. As the monthly trial balance is "taken off" with religious regularity *as proof of accuracy,* so the periodical audit should be "pulled off," regularly, as proof of dependability.

The chief accountant should insist upon his right to have his work reviewed, commented upon and certified to the "higher up" authorities or owners. He should insist upon this certification for himself as religiously as he insists upon vouchers for funds paid out on behalf of the company he serves. He owes to himself the exercising of his right to have his work, in general, reviewed and certified or vouchered, just as truly as he owes it to the company to have its payments vouchered or certified to as correct.

113. *The General Effect of the Audit Habit.*—As already

indicated, the real value is in the general habit, rather than in spasmodic audits. There is scarcely a person or practice connected with any institution that will not feel a stimulation whenever a change is made from a "no audit" policy to a fixed policy of a regular and effectual modern audit.

When a village announces an inspection of every premise with reference to its sanitary conditions and its general attractiveness, the good is provided for, largely, when the inspection committee and the day of inspection have been announced. Were it not for the moral effect, in future years, the tour of inspection might almost be dispensed with. The great value is not so much in the inspection as in the "general get ready" movement which precedes it.

The constant though more or less unrecognized "get ready" for an effectual regular audit is its most beneficient power. It might be better, perhaps, to say that its most beneficial effect is in the tremendous influence which it has in the direction of a "keep ready" condition, generally.

Many accounting forces are more or less pushed for time. It is in line with human nature that the matter which presses hardest gets attention first and most constantly. Preparation for an audit, like the taking off of trial balances, can be put off. If there has been no audit for two, three or five years, why should extra care be given "right now to keeping in shipshape for an audit, when everybody is so busy?"

114. *The Meaning of an Audit.*—Audio means, "I hear," Audit means, "he hears." But in its modern acceptance an audit has come to mean vastly more. The auditor of today must discover, in addition to hearing or seeing. He must not only discover—not only take the temperature and the pulse of the business—but he must diagnose. He must find out whether there is any trouble. He must also determine (1) exactly where the trouble is, and (2) exactly what the trouble is. But, in more recent times, the auditor must be able to suggest. If given a chance, he must be able to remedy every fault which he discovers—"a skilled investigator, continually applying wide training and experience to the discovery and best use of facts, from any material to which he can obtain access."

Of course the auditor must, himself, be a good bookkeeper, but he must be more. "Auditing deals with the more difficult and important problem of ascertaining the actual facts which have to be or should have been recorded in the books." There was a time when, in the auditing of utilities, as well as at present in many other lines of business, the competent auditor had to decide between sound and unsound commercial or financial principles. He had to decide, also, what interpretation should be given to certain legal and other documents, in making up his final statement of the assets, liabilities, profits, and losses.

Even now there is more or less need of this sort of ability on the part of the one who presumes to audit the accounts and affairs of a telephone company. But, as fast as the various commissions perfect their systems of uniform accounting, and, as fast as each telephone company approximates a perfect following of the system thus provided, the auditor's work of interpreting legal and other documents, and his work of deciding as to sound principles, will be diminished.

115. *The Purpose of an Audit in Detail.*—Besides the main object or purpose of an audit, as already mentioned in section No. 111, there are four definite and distinct objects as follows:

The improvement of accounting methods.

To point out errors of principle, if there be any.

To verify the mechanical accuracy of the accounts as rendered.

To detect and correct fraud.

In magazine articles and in books on "efficiency," "system," "short cuts," "office conveniences," etc., much has been said about the first of these purposes—the improvement of accounting methods. For this reason nothing need be offered here, further than the mere mention of it as one of the several objects of an audit.

As an illustration of the second purpose—the correction of errors of principle—reference might be made to the case mentioned in section No. 49 (TELEPHONY of November 13). Another illustration is the following:

In a certain lawsuit concerning telephone matters, it was seriously contended that service sold as much as two and three years in advance should be accredited entirely to the *earnings* of the month in which the cash was actually received. These and similar matters come within the province of the auditor whose duty it is to correct errors of practice or misapplication of principles.

All are familiar with the feature of an audit which verifies or corrects the mechanical part of the books. In the detection of fraud, however, there are features which may be given special consideration, at this time. With the kind of fraud which expresses itself in theft, all are familiar. But there are other kinds of fraud and deception. Every telephone man of broad experience knows of more than one case where the accounts have been so kept as to "make a showing of profit" at the expense of depreciation reserve or some other equally necessary item of actual expense.

There is said to be at least one case in which the deception is wholly on the other side. One man, sole owner of his plant, has done so much of the work of building both the equipment and the plant of his exchange that it stands upon his books as costing only $20 per telephone. That is a species of self-deception. It may not be "fraud," strictly speaking, but it serves to indicate some of the things which the auditor should correct, if not as fraud, at least as its first cousin.

Many companies have lived through a period of ten or fifteen years in spite of the fact that no one connected with them has ever made a complete list including every item of liability. Many have never even had a complete list of assets. It would hardly be right to say that this is fraud; but it borders upon criminal carelessness or neglect.

116. *Locating Fraudulent Practices.*—There are many methods by which fraud has been concealed, for a time, by accountants. Many of the fraudulent entries escape notice, also, because the accountant merely "borrows" and repays, without ever really being caught "short." It is the temptation to do just this which should cause employers, in all kindness, to provide at the very beginning for periodic, if not regular, audits.

It has been said that 98 per cent. of the temptation to pilfer is removed if matters are so arranged that more than one person must know about the theft, in order to accomplish it. It might be said, also, that much of the temptation to make the first temporary "loan" would be removed if the person in

charge were always uncertain as to whether or not his cash would be counted within an hour, and the figure thus obtained used as the first item in the verification of his entire work.

117. *Verification by Averages.*—In auditing, as in most other important matters of business, a liberal amount of intuition or horse sense is a valuable help. As an illustration this case may be cited: A certain engineer was more proficient in the use of his "constants" that in the use of that uncommon thing called common sense. Estimates were being made for the construction of certain underground extensions of a telephone plant. Among the figures turned in by this engineer was the total figure for a manhole. It was estimated to cost $495.

The manager of the company was not an engineer, but in looking over the estimate that was the first item to catch his eye, and, in an instant he guessed what the trouble was. He turned the entire estimate back, without further comment than that he felt confident it was in error, and required that it be carefully re-checked. The re-checking was done, and the estimate presented by the engineer in person, who was ready to defend it with all of his pent-up energy. After allowing the engineer to commit himself beyond recall, to the estimate as a whole, and to every separate item in particular, the manager requested him to bring in the figures covering the last manhole built. The cost was between $45 and $50.

After letting that fact "soak in" upon the mind of the engineer, the manager asked if the latter still held that his estimate was correct. Even then the engineer did not "catch on." He still defended his estimate. When the manager placed the actual cost of the last built manhole beside the estimated cost of the one which was about to be built, the engineer said: "Oh! I made a mistake in punctuating with my decimal point. It should be $49.50 instead of $495."

Now that sort of a temperament would not do for an auditor. To be successful as an auditor, one must be always, unconsciously perhaps, realizing whether an ordinary manhole really should cost $495, or whether $49.50 would be a more common-sense figure. In support of the necessity for auditors to have this trait of sensing things by averages, or, a general stock of horse sense, the following from a report of a recent valuation conference is offered:

"John G. Morse, appraiser of the Associated Factory Mutual Fire Insurance Cos., of Boston, described the methods of his organization whereby an accurate appraisal of manufacturing property for insurance purposes is made in a few days of actual field work and a few more of office work. He asserted that it is useless to waste time on minor details in appraisal work when a large portion of such work must of necessity be based on estimate. Mr. Morse said that it would take very little effort to demonstrate to any court how largely estimate enters into any appraisal and that an appraisal made on broad common-sense lines can be just as accurate as one made in great detail."

The foregoing is not given as an argument for estimates in the work of appraising telephone plants. It is offered, however, as evidence of the possibility of an auditor knowing, by intuition and by the law of averages, where to look for the weak spots in telephone accounts, after he has once secured a line-up on the unit costs of maintenance, construction operation, etc., for a large number of the best managed companies.

(To be Continued)

Telephone Growth in Western Canada.

Telephone service is growing rapidly in Western Canada, the figures recently compiled by the Grand Trunk Railway showing the greatest percentage of growth in the history of the industry.

In Saskatchewan, where the system is owned by the government, the long distance wire miles increased from 3,280 in February, 1910, to 15,760 in April, 1915; exchanges increased from 20 to 99, and the toll offices from 100 to 311 in the same period. There are also over 12,500 pole miles of lines owned and operated by nearly 500 farmer companies, serving some 13,000 subscribers.

The total amount of debentures issued by local telephone companies, authorized by the government of Saskatchewan for the last fiscal year, was $904,800; an expenditure approximating one million dollars, which was made possible for the farmers under this system.

In Manitoba, where the government also owns the lines, the exchanges increased from 70 to 123, the toll offices from 29 to 51, the local subscribers from 12,519 to 34,595 and the rural subscribers from 1,523 to 11,215. Earnings of the system for the last fiscal year were $1,824,115 and expenses $1,768,047.56, leaving a net profit to the public of $56,067.45. The plant, equipment and reserve for replacement have a value of over $11,000,000, in which the provincial government has invested over $10,000,000.

Reorganization of Cumberland Valley Company Effected.

The Cumberland Valley Telephone Co., of Harrisburg, Pa., which has been in the hands of a receiver for several years, has been reorganized and is again on an independent footing, financially.

Henry M. Tracy, who had been receiver of the company, was chosen president; William J. Lescure, vice-president; Oscar K. Kines, secretary-treasurer, and James Brady, Charles A. Kunkel, John E. Fox, Henry M. Tracy and William J. Lescure, directors.

The company was sold at auction sale, on November 5, of last year, the present directors purchasing it for the stockholders' protective association. At a recent meeting the capital of $750,000, held in trust by the directors for the stockholders was placed in the company's treasury and it will be distributed among the stockholders. There is $150,000 in first mortgages to be sold and $750,000 in general mortgage bonds to be distributed.

"The reorganization," said one of the directors, "will mean a reawakening here and throughout this district in the Independent lines. We are now on a firm foundation and better service will be one of the things that will follow."

Insurance for Employes of Louisville Home Company.

Between 400 and 500 employes of the Louisville (Ky.) Home Telephone Co. started the New Year under the protection of a group insurance policy taken out by the company for their protection. The holiday announcement was received with expressions of appreciation on the part of the employes, whose dependents are thus insured against hard times in the event of death of the employe provided for.

The higher salaried men are not included in the policy, which was written by a Louisville company under arrangements made by P. S. Pogue, general manager of the Louisville Home company. The benefit provided in each case is equal to a year's salary of the employe concerned. Provisions of the policy apply to those employes in the service of the company in Louisville. Several outlying exchanges are operated by the Louisville Home, but these are not covered.

The action of the company in providing this protection for its employes is the result of observations that they

respond to the right treatment. A statement issued in connection with the policy said in part: "The experience of the company is that a new employe is costly to the company to break in, consequently it has been the company's practice to endeavor to select good and competent help and then endeavor to treat this help well and advance its employes where possible, holding those who prove their good will. The company now has many employes who have been in its service since it was organized. Believing that the loyalty and co-operation of its employes has been a great benefit to the company the management took this means of showing its appreciation."

Mansfield (Ohio) Telephone Operators in Musical Comedy.

The girls of the Mansfield Telephone Co. and their friends gave an unusual holiday entertainment on December 28 to the people of Mansfield, Ohio, and telephone people from various parts of the state. In the production of a musical comedy called "Wireless," local people had everything to do. Miss Helen Hurst, who is a solicitor for the Mansfield company, wrote the play, and the music was written by Clarence Yuncker, a local musician. The play

Cast of Musical Comedy, "Wireless," Produced by Girls of the Mansfield (Ohio) Telephone Co.—The Author, Miss Helen Hurst.

was produced under the direction of Mrs. Eula M. Shryock. Two performances were given on Tuesday afternoon and evening to capacity audiences at the local opera house. The Mansfield News, in speaking of the comedy, says:

"Briefly, 'Wireless" is a happy potpourri of sense and nonsense, which is cleverly interwoven with musical numbers that set the feet to moving and the head to swaying. The plot tells of the efforts of a wireless salesman to interest the officers and employes of a telephone company in his wares. So deeply does he become involved that it takes three acts, every minute of which is a busy one, to straighten out the tangles, which multiply by leaps and bounds, until the ending comes in a natural way."

The thought of giving a musical comedy originated with a desire on the part of employes to do something worth while for charity. It is reported that after all expenses are paid, several hundred dollars will be available for this purpose. This unique amateur entertainment excited great interest in surrounding towns, and many telephone officials, employes and operators attended either one or the other of the performances.

The cast of characters is as follows:

"Billy," a telephone operator.....Goldie Shryock
Bunny Bain, a fresh young salesman.....David Boals
Annette, clerk to Roberts and Beverly.....Helen Hall
Western Union messenger boy.....Joseph Grohol
Office boy.....Robert Schell
Expressman.....Claude Zediker
Typewriter Girls: Grace Scott, Naomi McGuire, Opal Lindegger, Grace Morten, Lottie McMillin, Thelma Campbell and Eva Scott.
Mr. Beverly, manufacturer.....Walter Wentz
Mr. Roberts, manufacturer.....Benedict Carroll
Betty Roberts.....Ruby Cornwell
Roger Beverly.....Carlos Hughes
Jack.....Lawrence Hughes
Phyllis Beverly.....Ruth Koozer
First Butler.....Joseph Grohol
Cook.....Anna McMullen
Second Butler.....Claude Zediker
Mrs. Beverly.....Mildred Berry
John Hunter.....George Pfeifer
Mrs. Roberts.....Kitty Miller

In addition to the cast there was a chorus of 50, in which were many girls and boys who are members of the upper classes of the Mansfield high school.

The visitors from the outside towns were made the guests of the Mansfield Telephone Co. and were royally entertained during the day, and a splendid evening dinner was given to the visitors at the Vonhof Hotel by the directors of the local company. The list of out of town visitors was as follows:

P. R. Kelser, F. J. VanVoorhis, B. M. Critchfield, Frank L. Beam and E. O. Arnold, of Mt. Vernon; A. B. Crawford, Rollo R. Stevens, LeRoy Parker, C. C. Morris, J. C. Boush and Mildred Parker, of Columbus; F. D. Thomas, of Toledo; T. D. Thomas and C. J. Queen, of Akron.

Artie Geils, Frances Birch, Ruth Summers, Ruth Yetzer, Helen Gushoff, Emma Jollay, Harry Sotzen and Mrs. Sotzen, of Shelby; Sylvia Mix, of Butler; W. H. Lead, of Canton; A. W. Lane and W. M. Welker, of Massillon; C. L. Norton, of Cleveland; Amos A. Geiger, Ada Schnudt and Hazel Fuller, of Kenton.

Mary E. Moran, Edna Huffman, Hortens Crowe, Lillian Bloom, Pearl Bender, Leota Harris, Lydia Strauch, Etta Anderson, Howard Anderson, E. S. Anderson and M. C. Reed, of Crestline; Flora Steiner and Emma Steinle, of New Washington; Blanche Horton, of Granville.

Gustav Hirsch, of Columbus; Hattie Halliday, of Findlay; Lillian Davis and Mabel C. Grell, of Thompson; J. W. Flynn, of Cuyahoga Falls; Pauline Schonbar and Josephine Lanigan, of Newark; Vera M. Wages and Minnie Hyatt, of Fredericktown.

Rose C. Kerper, Lillian C. Lott, Clara A. Speck, Mattie Zook, Emma Howald, Irene Wagner, Mary Werhle, Robert R. Hunter and E. J. Eichorn, of Tiffin; Howard Swartz, Mont George, Ethel Brooks, Ada Brooks, Opal Glaisner and Edith Strickland, of Ashland.

1916 Advertising Message To Business America

By JOSEPH H. FINN

President Nichols-Finn Advertising Co., Chicago

Hail to the New Year of New Business in the New America!

If ever a year was born under a bright star of commercial promise for the United States, it is 1916. The Home Market holds America's destiny as never before.

Every business barometer registers good times ahead. If there is one pessimist of your acquaintance —one man who fails to realize what this wonderful new era of American business pre-eminence means—go at him broadside with these staggering truths.

FIGURES may be dull—but these proclaim FACTS—that are of TREMENDOUS import:

Crops—America's bulwark—have reached their record mark. The nation's principal farm crops this year are worth about $5,500,000,000—over half-a-million dollars more than in 1914, the previous banner year.

Clearances. The week ending December 4, 1915, checks for $4,986,000,000 passed through the country's clearing houses—the largest amount ever handled in one week's time.

Gold. Mr. Robert M. Woolley, director of the Mint, goes on record with the statement that the United States now has one-fourth of all the coined gold—the world's standard of value—a *phenomenal* condition!

an unmistakable danger to the enormous increase in the demand of the Home Market as well as shipments to the

could the United States do for industry—for its own progress—if a spirit of unity and high purpose could direct its action?"

And that is the most vital New Year's thought—perhaps the most important message that could be directed to Business America—the need for Unity and Action.

Let's go constructively after the Home Market—let's educate home buyers—let's do it with a VIM—TOGETHER! Let's use the power of the printed word. If you have goods to sell—let's ADVERTISE—and tell American consumers about them.

The way to accelerate prosperity in your direction is to

Note. Remember that the largest Blankets do best in an uncertain asset-seeking year, the fundamentals of the Int-

mand of the Home Market as well as shipments to the war countries.

Retail Sales. The biggest Christmas business in history is the cheering message from the retail shops.

Postal Receipts. Postmaster-General Burleson reports "postal receipts contain evidence of healthy and well-distributed prosperity in the country."

No matter where you look, you will find *something* to verify this *good times* message.

The big things for you to remember are—

—that Prosperity is NOT a mirage—a glorious prospect in the offing—it is an established fact—IT'S HERE—

—that in large measure the good times are *not* related to the needs and emergencies of European nations—

—that America is becoming more and more self-supporting—

—that Made-in-America—Made-by-Americans—Made-for-America—for American Profit is becoming more and more the country's safeguard and business insurance for the future.

If this be selfishness—let's have more of it.

And, most of all, remember that real solid and lasting prosperity in this country is based on the *Home Market*—and those who enjoy the biggest share of this prosperity will be they who realize what the Home Market means and who go most aggressively after it.

F. A. Vanderslip, President of the National City Bank of New York, an eminent financial authority, writes in "The Independent":

"There is capital available in this country to inaugurate enterprises that will employ every man in the country without a dollar's worth of war business. . . . If Great Britain and Germany each can raise approximately $6,000,000,000 in fifteen months for war purposes, what uncertain asset, resting upon the final solution of the International Credits problem—first, the establishment and then the protection of our own Merchant Marine.

What we have here at home, *we know we've got.* Our riches are here—in the soil—in the banks. And every day, as conditions better, there is a *wider* distribution of this national wealth.

Croakers—calamity howlers—need no longer wail for a return of the good old times. Here are times better than the old ones ever dared be!

Here is America's opportunity to grow as a commercial power—to heights which a few years ago seemed unattainable.

But, as always, the reward goes to those who are willing and brave enough to *act.*

Business America today is a gold mine—but the man who would succeed must wield his own pick and pan his own pay-ore. Lethargy is costly!

In England, those who side-step military enlistment are known as slackers. And the commercial "slackers" in the United States—those who hesitate now about taking the proper measure of promotional activity and sales stimulation—are wasting, I believe, the most precious opportunity that comes in a lifetime.

Here is the Business New Year—yours to do with as you will.

America has the money. Here, people are thinking buying thoughts.

With 1916 comes an epoch of unexampled prosperity—for the wise men of this business generation.

With this New Year, you stand on the threshold of Opportunity.

Are YOU going to enter?

It's up to you—*Advertise to the Home Market!*

Service Cost of Telephones Described by Commission

Epochal Decision of Wisconsin Railroad Commission Relative to Costs for Different Classes of Telephone Service—In Application of St. Croix Telephone Co. for Rate Increase, Cost of Service Is Allocated to Each Class of Subscriber—Final Installment

In the foregoing tables, the apportionment of foreign rural expenses between foreign rural service and New Richmond service has applied to the total of such foreign rural expenses. An examination of the situation of the foreign rural lines, however, leads us to conclude that it is not fair to the New Richmond company and its subscribers, to require them to share in all of the expenses of those lines, because of their use of the lines.

The foreign rural lines average ten miles in length while those owned by the St. Croix company average about eight miles. It is clear that if there were no limit placed on the reasonable exchange radius, rural lines, whose subscribers found it convenient to have connection with a city switchboard, might be so far extended that requiring the city exchange to share in all expenses of the rural lines would result in it paying more for the use of the lines than it would receive for the use of its lines and for the central office service which it affords. In other words, there must be a reasonable exchange limit placed at some point. In this case this appears to be at an average length of eight miles for rural lines, which is the average length of the St. Croix company's own rural lines.

We think that the St. Croix company should not be required to bear any part of the expenses of the rural lines incurred for the operation and upkeep of those lines beyond the reasonable exchange radius, even though such portions of the lines constitute, for operating purposes, an integral part of the New Richmond exchange.

If the reasonable exchange limits are placed at eight miles, approximately 80 per cent. of the foreign rural plant would lie within such limits, and 80 per cent. of foreign rural companies' expenses would be apportionable between their own lines and New Richmond. If New Richmond is to share in only 80 per cent. of foreign rural expenses, the amount of such expenses apportionable to New Richmond will be reduced from $567.08 as shown in the first column of Table 13, to $453.66, and the amount upon which to base rates for switching service would be $673.03 ($1,126.69—$453.66) instead of $559.61 ($1,126.69—$567.08).

The foregoing analyses show costs per telephone for each class as given in Table No. 14.

The costs per telephone in Table No. 14 include no toll expense whatever. As previously stated, toll expenses were excluded in total in order to determine, as closely as available facts would permit, what the effect would be of an assumption that the toll business should carry all expenses incident to it, instead of regarding the toll message as a part of the exchange business when it passes beyond the toll board. The results obtained are to some extent defective because of incompleteness of data at some points. In a general way they indicate that the amount received by the St. Croix company for toll business approximates the cost of such business through the toll board but is only a rather small part of the complete cost of carrying such business through to the subscribers' premises.

Cost.	Number of Telephones.	Cost per Telephone.	Class.
$1,507.51	86	$17.53	Business
3,393.59	291	11.66	Residence
2,597.70	161	16.13	St. Croix rural
*673.03	340	1.98	Foreign rural

*Based on 80 per cent. of Foreign Rural Expense.

Table No. 14. Costs Per Telephone.

The cost of toll connection business includes the cost of toll switching and checking, as well as the cost of handling originating and terminating toll business. According to the utility's report for 18 months ended December 31, 1914, revenues from all service furnished in connection with toll business, amounted to $1,269.52, or at the rate of about $800 for the period under consideration. For the fiscal year 1912-1913 the company's report shows revenues from this service amounting to $778.40.

The total cost of handling the toll connection business from subscribers' stations to long distance lines, including the cost of keeping necessary records, as shown by Table No. 13, was $1,529.97. No separate analysis has been made in this case to determine what the cost would be of handling toll connection business through the toll board only, but it will be noted that the apportioned cost of all service related to toll connection, was about $751.57 ($1,529.97—$778.40) more than the revenue from such service.

Toll Service Not Involved in Case.

The terms governing toll connections are not involved in this case. Although the cost of all toll connection service has been found to be much greater than the revenue derived specifically from this service, it does not follow that the utility is not being compensated for this service, or that payment for this service must necessarily be obtained from the toll as distinguished from the exchange business.

As previously stated, the general practice of telephone companies appears to be to regard the toll business, as far as it utilizes exchange plant, as exchange business and to have the exchange rates carry such part of the expenses as are involved in the utilization of the exchange plant for toll connection purposes. Such facts as we have with regard to conditions at New Richmond seem to indicate that to require subscribers to pay the difference between the total cost of toll connection service and the total direct revenue from such service would mean that exchange rates would have to carry more of the toll connection expenses than merely the amount incurred because of the use of exchange system plant for such service; in other words, that revenues from toll connections do not meet fully the expenses of handling the business at the toll board and keeping the required records.

It should be remembered, however, that the apportionments which have been made in the foregoing cost analysis are only tentative and that more complete development of these methods might produce different results, and further that the traffic study, covering a period of 24 hours, may be abnormal in some respects.

In the present case it seems only fair that the cost of toll connection business, as far as it is not covered by revenues from such business, should enter into the costs upon which exchange rates should be based, thus increasing the average cost per telephone connected to the New Richmond switchboard, by about 86 cents. If complete data for a long period were available with regard to toll traffic, it would be possible to make a division of this expense over the various classes of service upon a fairly accurate basis, but we believe that its distribution upon the basis of available toll traffic data would not be conclusive as to the proper amount to be borne by each class of service, inasmuch as toll business may be expected to vary considerably from time to time.

An addition of 86 cents per telephone to the costs exhibited in Table No. 14 results in costs as follows:

Business	$18.39
Residence	12.52
St. Croix rural	16.99
Foreign rural	2.84

The effect of any differences which would result from the use of a different method of apportioning toll connection expenses, would be so small as not to be of importance for any class of service except the foreign rural.

No attempt has been made in connection with this analysis of costs, to carry the apportionment to the point of showing the differences in cost between individual line and party line service, as it was not believed that information obtainable for sub-divisions of the classification would be of sufficient accuracy to make such an analysis worth while.

We come now to a more general consideration of the situation which may enable us to check up the results of the foregoing apportionments. At the time that the cost analysis was begun, the report for the last fiscal period was not available, so that the analysis has been made on the basis of 1913 figures supplemented by an audit by the commission's accounting staff, which showed expenses slightly different from those reported.

For 16 months ended December 31, 1914, the earnings and expenses of the company, as reported, were as follows:

Operating Revenues.

Exchange telephone earnings	$11,635.35
Earnings from connecting lines	2,592.05
Miscellaneous exchange system earnings	403.90
Total operating revenues	$14,631.30
Non-operating revenues	456.56
Total revenues	$15,087.86

Operating Expenses.

Central office	$ 4,714.17
Wire plant	835.93
Substation	1,420.54
Commercial	596.52
General	1,127.52
Undistributed	162.21
Total	$ 8,856.89
Available for interest and depreciation	$ 6,230.97

The valuation of the property as of March 1, 1914, showed a cost new of $27,981 and a cost new less depreciation of $19,475. The amount available for interest and depreciation for the 18 months was equivalent to 22.3 per cent. of the cost of reproduction.

The cost of plant as of July 1, 1913, as shown by the report of the company was $23,896.23, but additions increased its cost to $31,443.20 by December 31, 1914. The average cost of plant was $27,669.71, or very nearly the cost of reproduction as determined by the commission's valuation of March 1, 1914.

The number of subscribers as of June 30, 1913, was reported as 503, exclusive of foreign rural lines, and as of December 31, 1914, it was 566. The cost of plant per telephone, as taken from the company's reports, was thus $47.50 on June 30, 1913, and $55.50 on December 31, 1914.

For the year ended June 30, 1913, the report of the company shows revenues of $8,640.75 and expenses, exclusive of interest and depreciation of $5,533.77, leaving $3,106.98 available for interest and depreciation. The average of the book values reported for the beginning and end of the year was $22,653.90, so that the amount available for interest and depreciation was equivalent to 12.7 per cent. of the average book value. It should be noted that there is a discrepancy in the book values reported, for the amount as of July 1, 1913, is slightly lower than as of June 30, 1913, with no explanation, but the amount is not large enough to affect the results materially.

Operating expenses per telephone installed, based upon the average installation for the period, exclusive of foreign rural telephones, were $11.42 for 1913 and at the rate of $11.06 per year for the period from July 1, 1913, to December 31, 1914. The number of telephones used includes extensions and the operating expenses include all expenses except interest, taxes, and depreciation. The foreign rural telephones and the toll switching tend to distort the unit costs but even with allowance made for this, the costs do not appear to be much, if any, below average costs of equivalent service.

Conclusions.

Under the conditions as disclosed in the annual reports of the company, and in view of the analysis of expenses which we have made in connection with this case, it seems evident that the company is not in such a position that any very large increase in revenues should be authorized at the present time, and it also appears that certain of the increases which the company seeks to have authorized cannot be justified upon the basis of the cost of service.

It will be remembered that the final statement of the cost of service, based upon the analysis of one year's business as obtained from the report of the company and of the commission's auditor, showed an average cost, including a pro rata share of toll expenses not covered by toll revenues, of $18.39 for business telephones, $12.52 for residence telephones, $16.99 for St. Croix rural telephones, and $2.51 for foreign rural telephones. Although we cannot be guided entirely by the costs which have been determined in the analysis embodied in this decision, it seems to us that the results of that analysis are sufficiently accurate to show, within certain limits, which classes of rates should be increased and which classes should not be increased.

Although a traffic study taken for a longer period of time, or at different seasons of the year, might show a greater cost for foreign rural lines than that determined in this case, we do not feel that the cost will exceed the present rate, and the increase for switching service will not be authorized.

Similarly, the cost as determined by the foregoing analysis for business telephones, is so much lower than the average rate for such telephones that, even if allowance is made for some errors in the data upon which the apportionments were based, no increase in the rate for business telephones will be necessary.

The cost for St. Croix rural telephones is somewhat above the rate for such telephones. This application, however, does not seek to increase the rates on rural lines owned by the St. Croix company and in the absence of an application by the company to increase such rates, we do not feel that the increase should be made, because of the fact that our cost analysis shows a cost per telephone for this business slightly in excess of the rate for the service.

The average cost of residence service, as determined by our analysis, is slightly greater than the net rate for that service at the present time. The statement of the company that, in order to furnish single party residence service, it will be necessary to install a large amount of cable, makes it appear that if residence subscribers were to be satisfied with two-party or four-party service, the company might be saved a large additional investment.

The rate of $1 for single-party or two-party residence service is an unusually low rate for service of the character and extent furnished, and we feel that some increase in this rate should be authorized. The net rate of $1.25 for single-party residence service and of $1.15 for two-party residence service under the conditions prevailing at New Richmond, cannot be considered unreasonable.

It is therefore ordered, (1) That the applicant, the St. Croix Telephone Co., be, and the same hereby is, authorized to discontinue its present schedule of rates for residence telephones service and to substitute therefor the following schedule:

	Gross	Net
Single-party residence telephones, per month	$1.50	$1.25
Two-party residence telephones, per month	1.40	1.15
Four-party residence telephones, per month	1.25	1.00

(2) That the applicant be and the same hereby is authorized to amend its rates for extension telephones as asked in the application.

(3) That the application, as far as it affects other rates, be denied but that the company shall have the right to file with the commission a rule providing a reasonable penalty for failure to pay bills promptly.

Report of Central Home "I-Told-You-So" Club.

"Incomplete returns," as they say on election night, show that the "I-Told-You-So Club," of the Central Home Telephone & Telegraph Co., of Louisville, Ky., has attained an almost perfect score for the year, 1915. The club is the organization of managers of the various exchanges and districts of the company and set out at the beginning of 1915 to get efficiency in the operation of the company. Not all of the exchanges have reported 100 per cent. collections, but in each of such cases the failure to do so may be explained by the extraordinary local conditions which the company's representatives had to contend with.

Later returns may show a perfect score in the aggregate, but whether they do or not, this is incidental to the main purpose—efficiency—which had been attained. With virtually not an exception, all the exchanges have added new business to the books, while the system, as a whole and individually, has been operated more economically than ever before and at the same time all of the plants are in the very best of condition. Reports are being received from day to day by S. M. Heller, general manager of the Central Home company, and W. M. Brown, auditor, and will be tabulated shortly.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision Over Telephone Companies, Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchises, Rates and Service

Commission Dismisses Inductive Interference Cases.

On motion of J. T. Shaw, representing the Pacific Telephone & Telegraph Co., the California Railroad Commission recently dismissed the inductive interference cases brought by the telephone company against the Great Western Power Co., the Coast Valleys Gas & Electric Co., and the Sierra & San Francisco Power Co.

The cases were brought more than two years ago and complained that by reason of the fact that the power companies' high tension lines ran parallel and in close proximity to the telephone wires of the complainant in the vicinity of Napa, San Jose and Gilroy, communication over the telephone wires became practically impossible and great danger from fire and electrical shock was caused.

Mr. Shaw stated that since that time an extensive investigation has been made by a joint committee on inductive interference composed of the leading engineers of the state. The result of their labors was incorporated in a report which was submitted to the commission. The latter body thereupon issued an order known as General Order 39, which instructs power companies how, to a large extent, the troubles brought about by such paralleling of lines may be avoided. If this order was carried out by all the power companies, Mr. Shaw said, it would remove the grounds of his company's present complaint.

Protests Two-Party Business Rate for Washington, D. C.

Protest against the new two-party business line telephone rate, which is to be put into effect April 1, by the Chesapeake & Potomac Telephone Co., was recently filed with the Public Utilities Commission of the District of Columbia, by John T. Twohey.

The present cost for a two-party line is $2.50 per month for a maximum of 30 calls, a minimum return to the company of 8⅓ cents per call.

Under the new rate the maximum number of calls is increased to 40, the monthly cost to the patron to remain at $2.50, thus reducing the minimum return to the company 6¼ cents per call.

Mr. Twohey asserts that the average two-party business line patron rarely uses his maximum number of calls. He proposes that the rate be placed at $2 instead of $2.50 a month, and the present maximum number of 30 calls be retained. This, he points out, would give the company a minimum return of 6⅔ cents a call, and the subscriber would realize a saving.

The suggestion will be taken up by the commission when it begins a general consideration of telephone rates after completing a valuation of the telephone company's property.

Wisconsin Commission Orders Telephone Lines to Connect.

Five telephone lines operating in the vicinity of Hingham, Sheboygan county, Wis., must connect physically under an order of the Wisconsin Railroad Commission, handed down December 29. Complaint was made by J. H. Huyck, of Hingham, that he was unable to get good service. The commission found that the territory was served by the Oostburg Telephone Co., the Adell Telephone Co., the Citizens' Telephone Co. and the Lima Telephone Co.

It ordered all these lines to make physical connection through a central switchboard in Hingham. It further ordered the Random Lake Telephone Co. to extend its lines from its present terminus to Hingham and connect with the same switchboard. Sixty days' time is given. If the companies are unable to agree on a rate, the commission stated it would take further testimony and establish a rate for the connection.

Sale of Bangor (Wis.) Telephone to Patrons.

The first experiment with a co-operative telephone company in the western section of the state will be made upon the purchase of the Bangor (Wis.) Telephone Co. from E. J. Kneen, J. R. Roberts, W. H. Page and others, by the patrons of the company. According to the agreement entered into by the stockholders and the prospective purchasers, the Wisconsin Railroad Commission is to make a new valuation of the property within 30 days, and the price will be the amount determined by the state board. In 1914 the Wisconsin Railroad Commission valued the property at $33,000.

The Bangor Telephone Co. owns the exchanges at Bangor, Holman and Mindere, and all connecting rural lines, and has between 900 and 1,000 subscribers. As the

result of a recent hearing before the Wisconsin Railroad Commission some of the rates of the company were increased 15 cents a month.

Commission Orders Physical Connection at Cornell, Wis.

Physical connection between the telephone lines of the Chippewa County Telephone Co., of Chippewa Falls, and the Cornell (Wis.) Telephone Co. was ordered by the Wisconsin Railroad Commission on December 31. These companies are given 30 days to comply with the order. The connections are to be made through the Cornell exchange, each company bearing its proportional share of the costs. This switchboard is to be connected with the Wisconsin Telephone Co. for toll calls, by order of the commission. For calls over each other's lines a charge of five cents per call is authorized.

Shaw (Wis.) Telephone Co. to Improve Its Service.

Improvements of service by the Shaw (Wis.) Telephone Co. were ordered by the Wisconsin Railroad Commission on December 31. It must construct, with the co-operation of the Wisconsin Telephone Co., a metallic circuit between Cleghorn exchange and the Eau Claire exchange of the Wisconsin Telephone Co. Improvements are also to be made in co-operation with the Eleva Farmers Telephone Co. with the grounded wire between the Eleva exchange and the Cleghorn exchange.

The operating day of the Shaw Telephone Co. is fixed at from 6 a. m. to 9 p. m., except between the months of March and November, when the office may open one hour later.

South Dakota Connection Dispute, an Interstate Matter.

A hearing was held recently by the South Dakota Railroad Commission relative to the matter of connecting the lines of the Grant County Telephone Co. with long distance lines to western parts of the state. The Northwestern Telephone Exchange Co., of Minneapolis, Minn., was made a co-defendant with the Dakota Central Telephone Co. The latter company showed that connections could be better made with the other company's lines at Ortonville, Minn., than with its own lines at Big Stone City or Milbank. This will take the matter out of the jurisdiction of the state commission, making it an interstate matter.

Complaint Against Rate Increase in New York Dismissed.

Commissioner Frank Irvine, of the New York Public Service Commission, recently dismissed the complaint of 13 owners of rural telephone lines centering at Owego, Tioga county, against the New York Telephone Co., as to a proposed increase of rates from $3 to $6 a year as a switching charge for providing local service in the Owego area to stations on the rural lines. Commissioner Irvine finds that no evidence was submitted by the complainants to show that the proposed increase was unreasonable and that the company produced figures to show that the cost of this switching service per station per year was $6.88.

House Bill Providing for Public Ownership.

A bill has been introduced in the state legislature by Robert E. Martin, of Hyde Park, Mass., which provides that any railroad, railway, system of telegraph or telephone, lighting or heating plant, distribution of water for domestic purposes, or any other public utility, may be purchased by the state or by any city or town.

The bill also provides that questions of the purchase of public utilities shall be submitted to the voters on the official ballot at a state election on the petition of 5 per cent. of the voters of the commonwealth if propositions for the state to make purchases are presented. In cases in which it is provided that cities or towns shall purchase public utilities the petitions for the placing of the questions on the ballot must be signed by 5 per cent. of the registered voters of such places.

Physical Connection Ordered at Lyndon, Wis.

The Wisconsin Railroad Commission has ordered a physical connection between the Mauston Electric Service Co. and the Farmers' Inter-County Mutual Telephone Co. through the exchange at Lyndon Station, Juneau county. The Mauston company must connect a metallic toll line from its switchboard to the switchboard at Lyndon Station. The work must be finished by May 1, 1916. The companies are directed to make their own agreements as to the charges for connections. If they cannot agree, however, the commission will take further notice of the matter.

Proposed Improvement by Michigan State in Detroit.

Improvements which will enable the company to meet the growth of the city for years to come, in all, aggregating an expenditure of between $1,500,000 and $1,600,000, are contemplated by the Michigan State Telephone Co. in connection with its Detroit service for 1916.

This increase in the service, however, as explained by Arthur von Schlegell, general manager of the company, will be deferred until definite action is taken by the state railroad commission on the company's application for permission to put its service on a metered and flat rate basis, which question will be considered by the commission.

New Rate Schedule Effective at New Paris, Ohio.

The New Paris Home Telephone Co., of New Paris, Ohio, put into effect on January 1 the following schedule of rates: Business telephone, $1.50 per month; party line residence telephone, $1 per month; and rural patrons, $1.25. This system extends from New Paris over the township to New Madison, Eldorado and West Manchester.

Consolidation of Bell and York State Systems.

According to an announcement made by District Manager W. C. Sexsmith, of the New York Telephone Co., the actual consolidation of the Bell and York State systems at Binghamton and Elmira, N. Y., will take place on March 4, 1916. In the interim new equipment will be installed in the New York Telephone Co.'s building on Henry street, Binghamton, to care for the merged system in that city.

Company Ordered to Install New System at Norman, Okla.

At a hearing held December 23 by the Oklahoma Corporation Commission on complaints against the Norman Telephone Co., of Norman, Okla., the company was given until September 1 to install a new and up-to-date telephone system in a new building.

Summary of State Commission Hearings and Rulings.

CALIFORNIA.

December: The commission issued an order authorizing the Pacific Telephone & Telegraph Co. to withdraw from the town of Kenwood and authorizing the Kenwood Rural Telephone Co. to enter that territory.

December 23: On motion of J. T. Shaw, representing the Pacific Telephone & Telegraph Co., the commission dismissed the inductive interference cases brought by the telephone company against several power companies in the state. Mr. Shaw stated that since the cases were filed, about two years ago, the commission after making an extensive investigation, issued an order instructing the power companies how to a large extent troubles brought about by paralleling of their lines with those

of telephone companies may be avoided. This order, Mr. Shaw believed, would remove the grounds for the company's complaint.

DISTRICT OF COLUMBIA.

December 30: Protest filed by John T. Twohey against the new two-party line business rate to be put into effect April 1 by the Chesapeake & Potomac Telephone Co. in Washington, D. C. The present cost for a two-party line is $2.50 for a maximum of 30 calls, while with the new rate the maximum number of calls is increased to 40. Mr. Twohey asserts that the average subscriber rarely uses his maximum number of calls and suggests that the commission establish a rate of $2 for 30 calls in place of $2.50 for 40 calls.

INDIANA.

December: The commission dismissed a complaint against the Seeleyville (Ind.) Telephone Co. by some of its subscribers who asked for better service. The Seeleyville company, it is said, is not financially able to make the changes to provide the service demanded.

December: The commission ordered the Clayton (Ind.) Telephone Co. to install a schedule of rates for telephone service which range from $1 to $1.25, and to pay to subscribers who have private switching facilities 25 cents a month when these facilities are used.

December: Morocco Telephone Co., Morocco, Ind., ordered to equalize its rates. Some of the company's subscribers were getting business telephones at a price under the rate of $1.50 established for these lines.

KANSAS.

December 22: Application filed by the Citizens Telephone Co., of Republic, Kan., for permission to increase its rates. The company's present charge is $1 a month. It proposes to put in a charge of $1.10 a month for wall telephones and $1.35 a month for desk telephones, all bills paid before the 15th of the current month to be given a 10 per cent discount.

MASSACHUSETTS.

December 30: Hearing on the subject of service and rates for extension telephones in the state, at which all persons having complaints to make on this phase of the telephone service were requested to be present.

MICHIGAN.

January 12: Continued hearing on application of the Michigan State Telephone Co. for permission to put its service on a metered and flat rate basis in Detroit.

MISSOURI.

December 27: Application filed by the Southwestern Telegraph & Telephone Co. of Missouri for authority to sell its Illinois property to the Southwestern Bell Telephone Co. of Illinois. The Illinois company, it is said, has agreed to pay for the property with $1,082,000 in stock to be issued for that purpose.

January 22: Continued hearing in the matter of the application of the Kansas City Southern Railway Co., asking that the commission adopt uniform rules and regulations governing the construction of telephone, telegraph and other electrical signaling wires over the tracks and rights of way of railroad companies in the state. A committee has been appointed, composed of members of the different wire using companies, with Commissioner Howard B. Shaw, as chairman, to secure data and draft a set of proposed specifications for the instructions.

NEBRASKA.

December 30: Hearing on application of the Lincoln Telephone & Telegraph Co. for permission to change its rates at Glenville. The petition asks for reduction of 50 cents a month for residence telephones and no change in one-party business telephones, but an increase from $2.75 to $3 for two-party residence telephones and the four-party residence rate to be cancelled.

January 4: Hearing on application of the Gothenburg (Neb.) Telephone Exchange for permission to increase its farm line switching rate from 25 to 50 cents per month.

January 5: Hearing on application of the Lincoln Telephone & Telegraph Co., for permission to increase its farm line switching rate at Syracuse from 30 to 50 cents per month.

January 6: Hearing on application of the Glenville Telephone Co. for permission to establish a ten-cent toll rate applicable to non-subscribers for service between Blue Hill and Pauline.

NEW YORK.

December: The commission dismissed the complaint of 13 owners of rural telephone lines centering at Owego, Tioga county, against the New York Telephone Co. as to a proposed increase of rates from $3 to $6 a year as a switching charge for providing local service in the Owego area to stations on the rural lines.

January 4: Hearing of complaint of Paul Smith's Hotel Co. against the Mountain Home Telephone Co., of Plattsburg, N. Y., as to service charge between lines of the hotel company and the telephone company.

January 4: Hearing in the matter of recommendations of the commission for improvement of the service of the Walton People's Telephone Co., of Walton, N. Y.

NORTH DAKOTA.

December: Complaint filed by subscribers of the Griggs County Telephone Co. at Jesse, N. D., against the new rates recently put into effect by that company.

OHIO.

December: Complaint filed by the city of Elyria, Ohio, by its solicitor, the city council and G. B. Findley, individually, against the Elyria Telephone Co., alleging that its rates are unjust, unreasonable and discriminatory.

January 27: Hearing of protest of the Lima Telephone & Telegraph Co., against the tentative valuation recently placed upon its plant by the commission. The company charges that the commission's experts in valuing the property 8 to 10 per cent. lower than did the company, have undervalued certain factors that enter into the appraisement.

OKLAHOMA.

December 23: Norman (Okla.) Telephone Co. given until September 1 to install a new and up-to-date telephone system in a new building. This is the outcome of numerous complaints filed with the commission by subscribers of the Norman company.

January 10: Continued hearing on the complaint of subscribers of the Pioneer Telephone & Telegraph Co. at Ardmore, Okla. At a previous hearing the commission gave the company 30 days within which to improve service before proceeding upon the complaint.

SOUTH DAKOTA.

December 17:. At the hearing in the matter of connecting the lines of the Grant County Telephone Co. for long distance service with western parts of the state, the Northwestern Telephone Exchange Co., of Minneapolis, Minn., was made a co-defendant with the Dakota Central Telephone Co. The latter defendant showed that connections could better be made with the other company's lines at Ortonville, Minn., than with its own lines at Big Stone City or Milbank. This takes the matter out of the jurisdiction of the state commission, making it an interstate matter.

WASHINGTON.

January 24: Hearing on state-wide investigation of the Pacific Telephone & Telegraph Co. with a view to determining the reasonableness of the company's rates, both local and long distance. At this hearing the figures obtained by the commission's field engineers during the past year will be used together with the company's figures, in an effort to determine the fair value of the plant.

WISCONSIN.

December: The commission ordered physical connection between the Mauston Electric Service Co. and the Farmers' Inter-County Mutual Telephone Co., through the exchange at Lyndon Station, Wis.

December 29: The commission ordered the Oostburg Telephone Co., the Adell Telephone Co., the Citizens Telephone Co. and the Lima Telephone Co., all operating in the vicinity of Hingham, Wis., to connect their lines through a central switchboard in Hingham. It also ordered the Random Lake Telephone Co. to extend its lines to Hingham and connect with the same switchboard.

December 30: The commission ordered the Riverview Telephone Co., of Fairchild, Wis., to improve its service, overhaul its lines and comply with the standards of service promulgated by the commission.

December 31: Physical connection ordered between the lines of the Chippewa County Telephone Co., of Chippewa Falls, Wis., and the Cornell (Wis.) Telephone Co. The connections are to be made through the Cornell exchange, each company bearing its proportional share of the cost. Connection is also to be made at Cornell with the lines of the Wisconsin Telephone Co. for toll calls, by order of the commission.

December 31: The commission ordered the Shaw (Wis.) Telephone Co. to improve its service by constructing in co-operation with the Wisconsin Telephone Co. a metallic circuit between the Cleghorn exchange and the Eau Claire exchange of the Wisconsin Telephone Co. Improvements are also to be made in co-operation with the Eleva Farmers Telephone Co. with the grounded wire between the Eleva exchange and the Cleghorn exchange.

"Telephony's" Home Study Course for Telephone Men

A Complete Presentation of the Principles Underlying Modern Telephony in All Its Branches—Arranged Systematically So That Regular Reading and Faithful Study Will Qualify Ambitious Men for Higher Positions—Prepared Under Supervision of Stanley R. Edwards—This Section Written by Jay G. Mitchell

Quiz Questions on the Preceding Installment.

272. When is a sluggish or slow-acting relay essential?

273. How does electromagnetic induction render possible the design of the slow-acting relay?

274. How is the necessary number of ampere turns secured in a copper slug of one turn?

275. Is the retarding effect of the copper slug the same on release as on pull up?

276. Are the induced currents in the copper slug in the same direction as those in the winding when the current in the winding is stopped?

277. Do the induced currents in the copper slug oppose the creation of a magnetic field when the current in the coil is started?

278. What is a useful concept of the nature of the copper slug on the core of the slow relay?

279. How does the length of the air gap control the action of the slow relay.

CHAPTER XIII. Direct Current Relays (Continued).

280. *Other relay structures in use.*—In the development of their standard form of direct current relay structure, the various manufacturers of common battery switchboard equipment have made use of several different mechanical motions to produce the desired result. In all the relays so far considered the action of the relay armature on the contact springs has been direct. That is to say, when the part of the armature nearest the contact springs is moved by the magnetic attraction of the core, it moves the contact springs or contact points with it in the same direction.

It is possible to arrange the elements of the relay so that the action of the armature on the contact springs is indirect. Such a relay is shown in Fig. 116. The armature, *A*, by its motion toward the core, *B*, forces the contact spring, *C*, upward through pressure of the roller, *D*. This type of relay is open to the same criticism that some of the earlier types were.

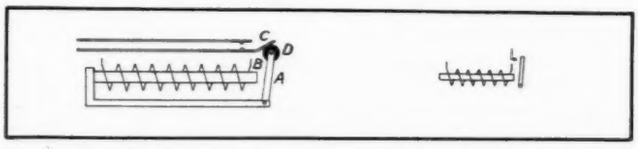


Fig. 116. Relay with Indirect-Acting, Roller-Tipped Armature.

It is not possible to so design the mechanical parts that the travel of the contact spring under any conditions of satisfactory adjustment is much, if any, greater than the travel of the armature.

Another somewhat similar development of the same principle is shown in Fig. 117. In this relay the springs are set on edge instead of in a horizontal plane and the main lever springs are equipped with a miniature roller which bears against a wedge-shaped piece mounted at the upper end of the armature. As the armature approaches the end of the core, this wedge-shaped piece is forced between the rollers of the two

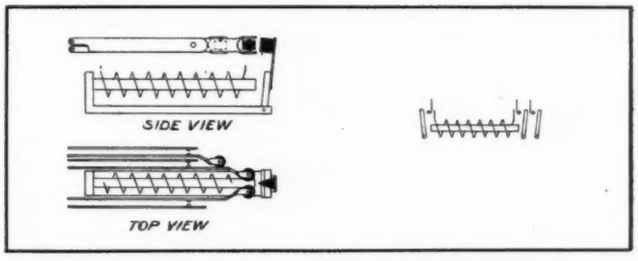


Fig. 117. Indirect-Acting Armature and Roller-Tipped Springs.

heavier lever springs and through them the movement desired in the contact springs is accomplished.

This relay is opened to the same criticism as the one shown in Fig. 116. It does, however, offer a means for operating a great number of contact springs, as additional ones may easily be installed at the side, provided that each one is equipped with its proper miniature roller to reduce the friction with its neighbor. The same principle has been developed in England without the use of the rollers. This very considerably reduces the number of springs possible, however, on account of the increased friction.

281. *The travel of contact springs.*—The travel of the contact springs in this type is determined, of course, by the shape of the wedge-shaped piece at the top of the armature. In the same way the travel of the contact springs in the relay shown in Fig. 116 is determined by the bent portion of the lever spring. If the wedge in Fig. 117 is short and blunt, the lever contact springs will be thrown farther to the side for a given armature travel than they would be if the wedge were sharper and more pointed.

In the relay of Fig. 116, if the bent part of the spring is at a small angle with the other part, the throw of the contact spring will not be as great as it would be in case the bend at the end of the spring were more abrupt. When the wedge of Fig. 117 is blunt, however, and the angle of the bend of Fig. 116 is greater, the *power* required to operate the lever springs is increased. For this reason, practical conditions of operation limit the travel of the contact springs in these two types of relay to very little more than may be obtained by the ordinary type such as is shown in Fig. 108 (TELEPHONY, December 18, 1915).

282. *Uses of standard relays.*—All the standard forms of relays so far described are employed in common battery switch-

board equipment. In the comparatively small number of target signal, common battery switchboards, the standard type of relay is used to control the supervisory signals and other local conditions in the cord and trunk circuits. In the lamp signal, common battery switchboards, relays of the standard type are required for the line, lamp, and cut-off circuits as well as the superivsory and testing circuits of the cords and trunks.

Numberless arrangements of the contact springs are called for by the different circuit requirements, as well as a great many different operating coil resistances. In all cases, however, the same basic principles will be found to cover the operation and employment of the relay equipment. The sluggish or slow-acting relay is used much more extensively in automatic and semi-automatic equipment than in manually operated equipment. There are many other forms of relay, operated by currents of various character; but they are not so widely employed as the standard types already touched upon.

It may be truthfully said that the standard type of direct current relay is without doubt an essential and indispensible element in modern common battery switchboard equipment. It is important to note the wide limits over which the satisfactory operation of any one of the standard types of relay extends. In other words, it is remarkable how far the operating currents may vary from their normal or avetage strength and still afford the most satisfactory results in the operation of the relay.

(To be Continued)

Y. M. C. A. Boys Visit Telephone Exchange.

Eighteen boys, members of the Y. M. C. A. boy's division, recently visited the exchange of the Nebraska Telephone Co., at Grand Island, Neb., Manager C. W. Rees acting as guide and lecturer.

The tour of inspection started in the operators' room, where the operation of the switchboards was explained. From there they were conducted to the wire chief's department, where they were shown the main distributing and intermediate frames, also the relay rack and the lightning protectors.

The batteries and power equipment were shown and explained by Manager Rees. An explanation of the manner in which tests are made for locating of wire trouble proved very interesting.

New Exchange at Albany, N. Y., to Be Cut Over Soon.

Since June last preparations have been under way by the engineers of the New York Telephone Co. to cut over its entire "Main" central office in the old building at Chapel street and Maiden Lane to the new building erected for the company at State and Park streets, Albany, N. Y. The work will be done on the last day of January, when it is expected that the cut over from the old switchboard to the new one will be completed in two minutes. The telephone company's "Main" office takes care of 20,067 subscribers in Albany and Rensselaer. Subscribers in the western section of Albany and a considerable portion of Rensselaer are served by branch offices, and will not be affected by the cut over.

For a short time before and after making the cut over full forces of operators will be at work both in the old and new buildings. The second, third and fourth floors in the new building will be given over to the switchboards for both local and long distance lines. The engineers have designed the switchboard rooms and their accessories for a growth of at least 25 years. The "Main" board on the third floor of the new home will have positions for 72 operators. The ultimate capacity of the board will be 10,500 lines.

Long Distance Service of Postal Company.

The long distance telephone service of the Postal Telegraph-Cable Co., which has been established between Peoria and Chicago, Joliet, La Salle, Morris, and Ottawa, Ill., is reported as being a success in every way.

An innovation has been established in this service by the Postal company by limiting the time of conversation to five minutes instead of three as is the custom with other telephone companies. The charge for the first five minutes of conversation from Peoria to Chicago is 75 cents with a 15-cent charge for each additional minute. The charge from Peoria to Joliet for the first five minutes is 50 cents, to La Salle 30 cents, to Morris 50 cents and to Ottawa, 35 cents with a 10-cent charge for each additional minute.

Bell Company to Build New Plant at Tucson, Ariz.

Work has been started on the new plant of the Mountain States Telephone & Telegraph Co., on East Pennington street, Tucson, Ariz. The building will be a two-story fireproof structure of white pressed brick with terra cotta trimmings.

In the basement will be located the store rooms, battery room, boiler rooms, heating and cooling plant. On the first floor will be located the general offices of the company, while the second floor will be devoted to the operating rooms.

The structure will cost approximately $70,000.

Need Not Re-Install Telephone Used for Illicit Purposes.

Justice Clark, in the Queens County superior court recently refused to grant a writ of mandamus against the New York Telephone Co., by which it was sought to compel the company to install a telephone in the shoe store of Herman Fost, at 93 Borden avenue, Long Island City.

The company refused to install a telephone in Fost's store following a raid by the police when they removed the telephone, on the complaint that he was using it to assist in bookmaking. The police directed the company not to install any more telephones in Fost's place.

Addition to Cleveland, Ohio, Exchange.

Work on a new two-story addition to the Eddy exchange of the Cleveland Telephone Co., Cleveland, will be commenced shortly. The building will be 53 by 44 feet and will cost approximately $22,000. The basement is to be occupied by a power plant and battery room, the first floor with dining and rest rooms for the operators and the second floor as an operating room.

Trouble Complaints in Hull, England.

An average of two cases of trouble per instrument per year is the report of the Hull telephone service of England, which recently investigated complaints of inefficient service. According to the manager, out of 25 working days last August, came 3,416 complaints by letter, messenger and by telephone, and out of this number 869 cases were found to be without cause. During the same period of time, the number of switched calls reached over 2,000,000.

Wisconsin Telephone Co. to Spend $300,000.

The expenditure of $300,000 for improvements and additions to the property of the Wisconsin Telephone Co. were approved at a recent meeting of the board of directors. Of this amount $125,000 is to spent in Milwaukee and $175,000 elsewhere in the state.

Relation of Employes' Meetings to Efficient Management

Benefits Derived from the Different Classes of Employes' Meetings—Work Done by the Ohio Automatic Association—Formation of a Similar Association by Manual Companies, Suggested—Paper Presented at Convention of Ohio Independent Telephone Association

By Chas. E. Hollander

The organization of a telephone company is in all cases almost identical, whether the company be large or small. The larger companies may have a greater degree of refinement in department organization than its smaller neighbors, but the underlying principles of its structure are the same—as are also its aims and ambitions—for we are all striving first of all to create a service which will bring us success financially, and insure our continued prosperity.

Taking for granted the fact that we have ordinarily proficient workmen whom we have provided with suitable tools to accomplish our purpose, then the problem of keeping the workman up to a high standard of usefulness and keeping the tools provided him in a state as near to perfection as possible, is reduced to a fairly simple one.

The workman must not only earn his wage. He must do something more than this—he must earn a substantial surplus over and above his wage. In other words, the company that employs him must make a profit on his services, just as much so—though not as easily figured directly—as the merchant must make on the sales of his goods, or a plumber must make from his workmen. And we, who are householders, all know something about the plumbers' profits.

Qualifications of a Profitable Workman.

What must be the qualifications of a profitable workman? Omitting minor ones, I should say that knowledge, ability and willingness are the cardinal and underlying virtues which he must possess.

Of knowledge and ability he must have some foundation; willingness must to a great extent be ingrained. Taking his stock of knowledge which we may assume as sufficient for the ordinary conduct of his work for granted, we naturally wish to increase it so that he may be a paying proposition. Let us overlook the old precept of "Experience is the best teacher" as it is too slow and expensive to be followed out by each workman individually. But let us substitute the old adage, with which all stenographers are so familiar, "Many men, many minds," and this leads us up to our real subject, "Meetings."

We may for purposes of convenience divide our subject into four subdivisions, as follows:

(1) Meetings between the officers and employes of the company.
(2) Between the heads of departments.
(3) Between the operators.
(4) Between the maintenance and construction forces.

Meetings Between Officers and Employes.

The first division, that of meetings between officers and employes, is perhaps not of quite as much importance as the others, but the results obtained will be sufficient to more than compensate for the expense. This may take the form of some entertainment, such as a dinner or picnic, at which the officers should be well distributed among employes, with talks and remarks from both.

Here the officer or director comes into personal contact with the men and women who are operating his company. They acquire each other's viewpoints and a spirit of interest is immediately noticeable in the work of the employe, while the employer looks at the work performed and the worker from a different angle and viewpoint, and, naturally, shows more consideration and a greater interest in the private affairs of each individual employe. A spirit of good fellowship is thus obtained which it is impossible to measure in a financial way, but which is nevertheless plainly manifest, and is of incalculable value. No company can afford to do without this friendly spirit, which is the direct outcome of these pleasant and informal gatherings.

At least weekly, the heads of departments such as construction, maintenance, purchasing, traffic and accounting should meet with the manager in order that they may work in better harmony and to the best interests of the business. Any disputes, questions of duties, friction between different departments, ideas as to betterment of service, etc., should be worked out and presented in a concise and impartial form for adjustment or discussion.

New rules, specifications, short cuts, savings in light, heat, power, etc., very often are suggested and put into operation.

These meetings are not so necessary in the smaller companies where the manager comes in contact with his immediate helpers daily and sometimes even hourly, but for the larger companies they are not only very beneficial but almost indispensable.

Operators' Meetings.

Operators' meetings probably show quicker and more direct results than any of the different forms of these meetings. A little over a year ago, the first of these gatherings was held in Ohio with the result that the Ohio State Telephone Co. went into the matter quite extensively and conducted operators' schools at a number of different points in the state. Many points as to transmission, inferior service, etc., were brought out and the trouble remedied.

Operators became not only better acquainted but where certain ones had been almost enemies—quarreling and disputing over circuits, holding up calls, and disorganizing the service generally—they became, because of the personal contact made possible by these meetings, warm personal friends. They are now helping each other in their work in place of hindering; they no longer argue and fight over connections but they work in close harmony and help each other in every way possible.

A noticeable improvement has taken place, in the long distance service especially, all over the state. Books of rules have been compiled and printed, while certain codes which are uniform, methods of busy tests, ringing, answering, disconnection, etc., have been inaugurated. The first two or three of these operators' meetings which were held in our territory were more in the nature of social gatherings and experience meetings. Here the operators read papers which they had prepared themselves, discussed different phases and methods of their work and were more or less prepared to undertake and become interested in the subsequent meetings.

The later meetings were more in the nature of schools or lectures conducted by W. S. Vivian, secretary of the Independent Telephone Association of America. These were very successful and should be continued from time to time so that what has been gained will be held and even improved upon, and in order that the new operators coming into the service may have the benefit of them and understand more fully the meaning and use of the different rules and regulations which have been laid down for their use. Those who have attended these meetings have been surprised at the subjects which have been brought up and discussed to a satisfactory conclusion and at the wonderful results which have been attained.

Every company, no matter how small, should not fail to send all its operators to attend at least one of these meetings, if

the opportunity ever again occurs. Remember, it is the operator who comes in direct contact with your customer, "The Subscriber," and 80 per cent. of the satisfaction of your service depends upon *her* ability and willingness. An indifferent operator can become an exceedingly good one by a little help and training of this sort.

Co-operation of Maintenance and Construction Forces.

Co-operation is needed probably more between the maintenance and construction forces of a telephone plant than between any other two departments. The duties of each should be well defined and every effort should be made to have them work in perfect harmony. Our company has, during the fall, winter and spring months, meetings of these two departments which are held on the third Thursday of each month at 7 p. m.

Two years ago, when these meetings were first started, the men were ordered to report at 4:30 p. m., one-half hour before work was over, and the meeting was to close at 5:30, one hour being considered sufficient, of which the company was to give a half hour and the men the same. The first meeting lasted until after six, and the next adjourned so late that we were all late to supper. It was then decided, by vote, to hold them at 7 p. m., the company still giving a half hour and the meetings could last as long as anyone wished to stay. They very seldom close until 10 p. m.

It would be impossible in the short time at my disposal to enumerate, in detail, all the benefits which have resulted. We have, however, remedied many glaring faults; we have drawn up a set of specifications for installing telephones to suit our own conditions; we accept or reject new construction, switchboard or telephone equipment; and best of all, we all seem to be working in harmony and without friction. Our meetings have been discontinued since July, but began again this month. The superintendent of equipment is chairman of the association, while the foreman of one of the installation crews is secretary. A brief record is kept of all the meetings and once a year we hold a yearly review of everything which has been done.

Anyone, whether he be office boy, janitor, apprentice, troubleman, foreman, superintendent or manager, is at perfect liberty to get up and air his opinions. We all receive the same consideration and our suggestions or criticisms are discussed without fear or favor, and, personally, I am of the opinion—modest man that I am—that on 90 per cent. of the subjects, some one of the force knows 100 per cent. more about the matter than I do, and I doubt if our men are much more intelligent than the average practical telephone man. I have much more respect for their opinions and much more confidence in their judgment than I had before we started our Thursday night sessions. I must confess, I don't know what they think of me.

Meetings of the Ohio Automatic Association.

Before closing, I want to tell you something about the Ohio Automatic Telephone Association, of which the following companies are members: Akron, Alliance, Bucyrus, Cambridge, Columbus, Dayton, Kenton, Newark, St. Marys, Van Wert, Washington, C. H., Youngstown and Zanesville, of Ohio, and Richmond, Ind. There are associate members throughout the United States, Canada, Cuba, Europe, etc. This association was organized about four years ago and has been of great value to the different companies. Meetings are held every six weeks at the different plants, and nearly all the companies are usually represented. The last meeting was at Zanesville, November 8, at which there were 56 people in attendance.

As a rule, meetings are held on Monday. A criticizing committee meets at the plant on Sunday morning and a general inspection is made of all departments. The general appearance of the plant is commented upon, the switchboard is inspected, tests are made of the different parts of the apparatus, and all defects noted. Service tests are made, the general office, auditing department, storehouse, construction, troublemen—in fact, everything is gone over carefully and in detail, and a written report is made up which is read at the association meeting the next day. A copy of the report is given the company, criticized, and a detailed answer is called for at the next meeting. Each plant is visited at regular intervals.

The employes spend about a month previous to the visit getting everything in readiness for the inspection, and, as a rule, it takes about a month after the inspection to fix up the things which we miss getting ready for it. Believe me, they see everything; and it almost seems as though what they don't see they imagine. The best of it is, however, no one ever seems hurt. It is all taken in good part and if the report is too easy on the home company, we are all disappointed, even our hosts. To give a general idea of the way in which these criticisms are made, I will quote a paragraph from the criticism of the Newark plant, December 7, 1913, Mr. Swoyer, of Columbus, chairman:

"The state of Ohio prohibits the common drinking cup, but we notice that this fact has not yet reached Newark; still if the company can successfully evade the law, it might be well to wash the cup occasionally."

Hard on Newark! I would like to read you extracts from some of the other reports, but will spare the blushes of my good friends and members. We none of us come through the fire unscathed, but we are all more or less purified.

The Automatic Electric Co. is also represented by its operating department at these meetings and any improvements, suggestions and betterments are noted and often embodied in new apparatus.

A uniform system of trouble accounting has been adopted by the association, which conforms with the Interstate Commerce Commission's system of commercial accounting, and is kept by nearly all the regular and associate members. The different troubles and complaints are tabulated, reduced to a percentage basis and curves and comparisons are made from them between the different companies.

The value of these association meetings cannot be too highly estimated. There is no doubt that the service in every plant is infinitely better than it was before this association was formed.

We maintain our own office and stenographer who takes down the whole of each meeting in detail and mails a copy of it to all of the regular and associate members so that it may be available to all who are not able to attend the meetings.

Formation of Association by Manual Companies.

There is no reason why such an organization could not be formed by manual companies which would be much better in some way than the automatic association. The state could be divided into districts, and each district could have its own association, carrying on the work in a manner very similar to the work which we are now doing. The manual plants would find out facts in regard to their own service and maintenance of which they never suspected the existence.

In conclusion, I want to say that I know of no method by which a company can attain that degree of efficiency and co-operation in its employes for which we are all striving, as by the use of frequent meetings of this description. The small outlay pays for itself many fold and the worker is encouraged to greater effort and interest in his duty to himself and to his company.

Paducah Home Telephone Co. Receives New Franchise.

A 20-year franchise has been sold to the Paducah Home Telephone Co., of Paducah, Ky., thus placing the Paducah Home and the Cumberland Telephone & Telegraph Co. on the same basis as to rates, etc., in that city.

Pacific Bell Buys Chehalis, Wash., System.

The Pacific Telephone & Telegraph Co. recently purchased the Chehalis Telephone Exchange, of Chehalis, Wash., including all of the lines through the rural districts of Lewis county, from H. C. Coffman.

Practical Subjects—Letters and Discussions

Speeding up Telephone Collections.

In last week's issue of TELEPHONY was published an item relative to the plan adopted by H. J. Parsons, cashier of the Federal Telephone & Telegraph Co., of Buffalo, N. Y., for speeding up collections. Since then two additional "silent collectors" have come into the office. The fourth in the series of requests for payment is printed in green and red ink on white blotter paper, with the words "A Happy New Year" in large type across the top. The greeting continues immediately under the reproduction of the automatic dial in the upper left hand corner, "and Best Wishes from the Collection Department." Then in smaller type below are the words, "You can make our New Year brighter and happier by mailing your check today."

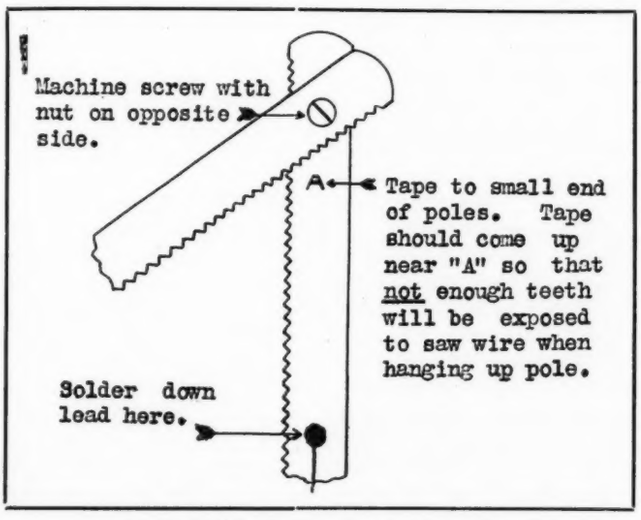
The last request is printed on buff colored blotter paper. The letters "S. O. S." are prominently displayed across the top, while below the reproduction of the automatic dial to the left are the words, "Send our Simoleons; they are long past due."

Locating Defective Sleeve Connections in Copper Circuits.

In making tests at various locations recently it has been found that many of the sleeve connections in copper toll lines are defective, although to all appearances they have been properly made up, says H. I. Birkhead, in the Southwestern Telephone News.

In balancing up several different circuits it was necessary to locate and cut out many sleeves, measuring as low as one-tenth of an ohm. The tests were made with a portable Weston mil-ammeter, reading 0 to 1,500.

My method of doing this is to connect a length of line, say six inches, in series with the instrument and one cell of dry battery, noting the reading (this connection should remain only an instant, so that the current will not drop, due to the low shunt on the battery), then connect the same length of line wire, containing the suspected joints in series with instrument and battery, again noting the readings, provided the contact on the line has been faultless, the joint is removed. Joints removed in this manner have shown from one-tenth to several ohms resistance when measured with a bridge and galvanometer.


Machine screw with nut on opposite side.
A
Tape to small end of poles. Tape should come up near "A" so that not enough teeth will be exposed to saw wire when hanging up pole.
Solder down lead here.

Device for Connecting to Line for Tests.

One dry cell in series with the leads up to the line and instrument will show a reading of from 600 to 1,200 milliamperes, depending upon the resistance of the leads and condition of battery. Since the resistance of the circuit is very low, a fraction of an ohm cut into it will reduce the current reading.

Here is quite a novel and practical method of making connection to the line for these tests that saves much time and labor in covering a stretch of line. Our toll lines are practically all on 25-foot poles, the highest wires being from 18 feet to 20 feet above the ground. Two 15-foot jointed fishing poles were secured, leads attached to each section and soldered at the brass joints on each end, hacksaw blades were procured, broken in two and fastened together with a machine screw, as illustrated. One of these hooks was secured to the small end of each pole and the lead soldered securely thereto.

The sections of the poles are joined together and the instrument and battery are connected to the leads at large end of poles. The poles are then hung over the line wire and by bringing a little downward pressure on the poles a perfect contact is secured. The saw teeth cut through the corrosion without the least injury to the wire.

I have covered ten wires for five miles in a day with this arrangement and located defective joints that it would have been impossible to locate from the test board, due to their very low resistance.

Laying Cable Underground Without Conduit.

It became known that we are using the trench method of underground construction in rebuilding our lines in the city, and we are besieged for information on the subject. A year ago we had one mile of cable to build. After conferring with other companies that have had some work like this for a number of years, we decided to simply dig a trench 24 inches deep, and 12 inches wide. The cable was laid in the trench and covered up, particular care being taken that pure Mother Earth was next to the cable. A 100-pair lead-covered cable was used. About every block a branch with from 10 to 25 pairs was taken up a can pole for distribution. At the end of this cable, we have a 10-pair cable ending one mile from the central office.

This 10-pair cable carries five grounded farmers' lines, before entering the main cable. The cross talk on these lines is hardly as bad as if they were open wire leads. Of course, each line takes one pair of wires, one wire grounded at the end of the line and the other at the end of the cable, thereby making the run through the cable, metallic. There is, of course, no cross talk at all between these lines and the full metallic lines in the same cable.

Many questions have been asked the writer regarding the durability of the sheath of the cable with no protection at all. These I will answer with a few questions.

Do you know that your city water pipe joins onto the main pipe with two feet of lead pipe? And do you know that that pipe has a steady pressure of about 80 pounds, and that trouble on these pipes is very rare?

Some will say as has already been asked: But, suppose there should be a little acid in the ground (and there is some in most cases) would it not eat away the sheath?

Do you know that in all phosphate plants, lead pipe is the only thing that can be used to convey the sulphuric acid from the tank to the plant?

The writer, in making an experiment, cut a piece of 100-pair cable, 18 inches long. On one end of the cable common lime was placed; on the other end sulphur was placed and in the center common earth. It was placed 12 inches in the earth. That was nine months ago and the sheath is in perfect order at this time.

Trouble? To this question we can answer that although lightning was very severe last summer, the cable has not up to this time showed any kind of trouble, even the slightest.

How would you locate your trouble if you should have water in the cable? My answer to this question is that it would be done with a wireless tester or with a bridge in the same way as with an aerial cable or cable in conduit.

You have all read about the new bug that has found its way now to Florida. This method of construction makes the cable bug-proof.

We have another mile of cable to lay within a few weeks and will not hesitate to use the method as just described. I do not think this method would work where there are electric cars unless a good sized copper wire, having a lower resistance than the sheath offers, be laid along with the cable and be properly bonded to the car tracks. Even this may not be altogether safe.

To those who wish to ask any questions not here brought out, the writer will take pleasure in answering if a self-addressed stamped envelope is enclosed.

J. O. Persons, Mgr.
Marshallville, Ga. Marshallville Telephone Co.

Securing Favorable Pubilicty at Local Industrial Exhibit.

At a recent local industrial exhibition held in the Armory at Louisville, Ky., the Louisville Home Telephone Co., by means of a booth, elaborately fitted out; free service to all who came up, "tracts" with good information, and a guessing contest, received much favorable publicity that began to be felt in a business way immediately. Some seven or eight years ago the same company made similar displays when other industrial exhibits were held. The memory of the good results from these previous displays was such that the company, under the direction of P. S. Pogue, general

Telephone Booth at Louisville Industrial Exhibition.

manager, and William B. Fisher, commercial superintendent, arranged to fit out another booth and take advantage of the publicity that would be available in that connection.

The booth shown in the accompanying illustration included a complete display of the various branch systems which the company puts into the establishment of its customers, intercommunicating exchanges which required the assistance of a house operator, as well as intercommunicating systems which operate automatically.

Four-page advertising folders containing information about the company as to the size of its business and the quantity and quality of its service, etc., were distributed. Those who wished to use the telephone were privileged to do so and connections were made with the main exchange and thence to any point in the city.

The feature which attracted most attention was the guessing contest. This called for guesses from the participants as to what they thought the number of calls made over the lines of the company would be on the Monday following the exhibition, which the officials of the Louisville Home did not know any more than the guessers themselves. The only help they were given was the statement on a placard that there were more than 200,000 calls handled every day over the lines of the company.

Of course the contest was purely a guessing contest. Those who knew anything about the telephone business knew that if the following Monday happened to be a bright day—which was the case—the number of calls would be thousands less than if the weather were inclement. Three prizes were offered: Installation of an instrument and free service for a year to the first prize winner, and similar awards for six and three months, respectively, for the second and third prize winners.

It turned out that the number of calls on the Monday following was 224,248. The winner of the first prize guessed 224,147; second, 224,369, and third, 224,381. Much general interest was created by this as well as other features of the company's display, giving the company considerable favorable publicity.

New Banking Facilities.

Imagine the surprise given a Fitchburg repair man when, upon removing the brass cup which covers the carbons on one of our standard protectors, he was showered with silver quarters, says a correspondent of Telephone Topics. Speculation was rife in his mind as to how they could possibly have come there. Could someone have gotten mixed up in the dark and mistaken it for a quarter gas meter. Surely no one could make that mistake. Was some one giving him a present? Certainly no one would take that way.

Perhaps it was someone's private bank, but no, that would be a startling new way to save money and one not liable to pay very good interest. He gave it up, although there was the money, four silver quarters, and they didn't belong to him. Surely, this was not according to routine.

So he took them to the lady of the house and explained the situation to her. She was highly delighted to get the money, and to find out at last where her missing quarters had gone, for, as she expressed it, "My old man has been snitching for some time, but I couldn't catch him."

We're pretty positive the repairman won't have to go there again for the same trouble.

Midwinter Convention of A. I. E. E.

The fourth midwinter convention of the American Institute of Electrical Engineers will be held in the Engineering Societies building, New York, February 8 and 9. The Institute convention will be followed by a convention of the Illuminating Engineering Society, in the same building, on February 10 and 11.

These dates were decided upon by co-operation of the two societies, for the convenience of members of either society who desire to attend the technical sessions and other events of both conventions, for which cordial invitations have been exchanged by the societies. Interesting programs of technical sessions and other features are being arranged.

Improvements During Past Year at Orfordville, Wis.

The Orfordville (Wis.) Telephone Co., of which F. A. Cole is manager, has carried through extensive alterations during the past year, including the removal of hundreds of miles of wires and their replacement by cable lines.

The Latest in Automatics

The efficiency and reliability of relays has been proven in every modern telephone system, whether manual or automatic.

The RELAY AUTOMATIC TELEPHONE SYSTEM uses relays only for all operations and offers a method whereby

MOVING MACHINERY IS ELIMINATED

from automatic telephony.

Our system will give you every class of automatic telephone service by the use of

RELAYS ONLY

Address communications in care of

Marconi Wireless Telegraph Co. of America
Woolworth Bldg., New York

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

Hail to the Chief of the Operating Room!

By William Brady.

Teachers, lady visitors and lovely women generally, with wonderful complexions and beautiful clothes and dainty oxfords and such sweet perfume about them, always did overawe my naturally retiring disposition, even when I was a little boy. Why, I can remember one occasion when I was a youngster—no, that isn't what I want to say; I'm still the youngest boy in my profession, bar none—but when I was fourteen years old I would have preferred a caning any time rather than to face my admiring teacher in the parlor on Saturday afternoon.

This unreasoning timidity has remained dormant in my system all these years, and whenever I have occasion to call the chief operator, it surges to the surface and makes my very voice tremble. Now, I've never met a chief face to face—I am content with what little speaking acquaintance I have struck up with her over the wire—but I have the clearest imaginable conception of her composite personality, just the same as though I were as thick as taffy with her tribe. One forms these impressions subconsciously, sort of a telepathy, I suppose you might call it. At any rate, when I call up the chief operator to ask what in thunder is wrong with the blamed telephone, you may be sure I don't couch my inquiry in any such language as that.

It is only with great difficulty that I can avoid saying "Ma'am" to her. At the beginning of the interview I sometimes feel like saying something that sounds like that, but that feeling soon passes away. A chief is one of the exceptional individuals whose personality carries over the wire.

She always has such a soft, gentle voice—yet every word she utters sinks into your very soul. You may be shouting in high displeasure, determined to make your kick a good one while you are at it, but if you pause an instant to catch your breath, the chief puts in a cool rejoinder that takes all the wind out of your sails in a jiffy. She has learned well the axiom that "a soft answer turneth away wrath." And she knows just where to put on the soft pedal. You can't excite her a bit; the best you can do is to create an inflection of resignation in her tone, which makes you feel like a low-down cad.

Remember, she is a lady, and you have nothing against her personally, except her enviable voice. You are registering a complaint against the service, which is a very impersonal, reasonably blameworthy thing. The chief operator serves as a shock absorber for the service. Her soft answers turn away destruction, for if she were to reply in kind, as you complain, there is no question that you'd tear the telephone off the desk. One day when I found her too busy to listen to my prayer, I replaced the receiver on the hook with so much spirit that it took a yard of adhesive plaster to remedy the damage—and that plaster is now a lesson in patience staring me in the face as I talk.

Tact is the first qualification for a successful chief. I think the company fully recognizes that, if I may judge by results. No matter how just the complaint, nor how pressing the fault in the service, she has a way of telling you things that makes you half regret your hasty criticism. And you feel so small about it, even if the bill comes in as promptly as usual. I don't think I've ever had a conversation with the chief without hanging up the receiver in serious doubt whether I was the boss or the office boy. She probably doesn't intend to make one an egregious ass, but the feeling is there just the same. Each time you swear softly to yourself that you'll complain no more—but you know it is only an idle resolution.

As soon as I can afford it, I hope to hire a lady who has had, say, a year's experience as chief operator in some busy exchange to look after the business side of my practice. With her soft answers and discreet methods, she could save many times her salary in rebates which are now exacted by my patients. With her assistance I believe even my comparatively limited practice might support me in affluence. Whenever a cured patient should call to discuss the bill, I could pretend to be dreadfully busy—we doctors are great at that—and call Miss Ex-Chief to arrange the matter. I think I could safely leave it to her to make whatever terms she might deem equitable with the patient.

Another advantage in having such an assistant would be her ability to get service of the kind the contract calls for. Think of an ex-chief entering the lists against an active chief! You know what happens when an irresistible force meets an immovable object. The personality of an ex-chief in a doctor's office would be irresistable. My patients would have to say "Ma'am" to her when they came to say the other thing to me. Of course she would demand a tremendous big salary, but the short hours and congenial environment might be an inducement. I think it would be ideal to be in a position to tell all unsatisfied clients to "tell it to the chief." In the month of January, particularly, she would be worth her weight in rebates.

No chief operator has ever asked for my services, somehow, although I have worked untold miracles among the central operators in her charge. This is perhaps well enough, for I know I should get stage fright and mix up the medicines if a full-fledged chief were to call me to attend her. That unfortunate subconscious fear of teachers, ladies with delicate perfume about them, and sweet-voiced creatures who smile at you when they are really bored to death, intimidates me when I even dwell upon the thought of rendering first aid or any other aid to a real chief. If one ever does call me, I hope she will pose as a plain central girl until the crisis is past at any rate. The central girl takes whatever treatment one offers without objection, but a chief would probably make one think the treatment was a mistake, even though it might be just the thing.

Sometimes I have a vague yearning to be called to care for a sick chief whose identity shall remain unknown to me for the time being. Who knows but that her sweet temperament and her calm, quiet voice might cure me of my timidity? Just for the sake of experiment—we doctors are great for that, too—I would be willing to render gratis the best service at my command to a chief who would masquerade as an ordinary central operator throughout the illness. If such an experiment proved successful, it would be a great relief to unconquerable nervousness in conversing with her kind over the wire thereafter. It would increase my self-respect, or perhaps conceit would be a better name for it, and add to my usefulness in the world.

Some anonymous person recently sent a toy telephone set to my little girls. They have great fun with it but, as I listen to them talking, the dread steals upon me that one or both of them may ultimately grow up and become chief operators. Up to the present I have maintained my dignity unassailed in my own household, with the exception of small matters in which my distaff's judgment overrides my own, and I fondly hope that it shall ever be so. But if my own child should turn out to be a chief operator, what would happen to me? On one little circumstance I pin my faith in future peace, however: The little ones say "Hello, hello, hello!" every time they telephone, and no chief operator would ever say that.

Squirrels Put Telephones Out of Service.

According to J. F. Adams, manager of the Pacific Telephone & Telegraph Co., at San Mateo, Hillsborough and Burlingame, Cal., the peculiar appetite of the squirrel is responsible for putting a number of telephones out of order. During the dry season they had chewed the lead cables and coming of rain caused 300 out of 1,900 telephones to be temporarily put out of order.

New Exchange Cut Into Service at Rochester, N. Y.

The new Glenwood exchange of the Rochester Telephone Co., Rochester, N. Y., was recently cut into service. The exchange has an ultimate capacity for 6,000 subscribers and at present it is serving in the neighborhood of 2,000 patrons.

"Buy your insurance at cost"

This is the keynote of the UTILITIES INDEMNITY EXCHANGE, which has been operating with great satisfaction, for several years in the telephone field.

The UTILITIES INDEMNITY EXCHANGE saves its members a large portion on the premiums which they would ordinarily pay Old Line Insurance Companies, by carrying their own risks on a "Reciprocal Plan" known as "Inter-Insurance."

The losses are distributed among the members at actual cost with all unnecessary overhead charges eliminated and all claim settlements are made on an equitable basis with due regard to the humane treatment of injured employes.

This plan which has proven to be so highly acceptable to telephone companies because of its saving features, enables those engaged in the operation and construction of telephone plants to insure themselves against injury claims and fire losses at "actual cost" as many of the enormous overhead charges and operating expenses commonly prevalent in insurance companies are eliminated.

Are you a member? Are you going to join in 1916? Why not? Write for descriptive literature or request one of our representatives to call. Also let us send you testimonial letters from satisfied members.

Utilities Indemnity Exchange

LYNTON T. BLOCK, ATTORNEY AND MANAGER
RAILWAY EXCHANGE BLDG.
ST. LOUIS, MO.

Save 25% to 40% on your Insurance

From Factory and Salesroom

Conventions: Illinois, Springfield, January 18-20; Minnesota, Minneapolis, January 25-26; Wisconsin, Madison, February 9-11; Kansas, Topeka, February 15-17

An Installation of the S. R. Telephone System.

Some time ago the S-R. Electric Co. installed its system on one of the lines of the Morrison Telephone Co., Morrison, Ill. Shortly thereafter the Whiteside Sentinel, of Morrison, came out with an article relative to the system. Among other things The Sentinel said:

The Morrison Telephone Co. is making a test of a device for the prevention of listening-in on rural lines.

J. Skinderviken, inventor and patentee of this device, who has spent 24 years as a telephone expert, almost exclusively in rural communities in the United States, Canada and abroad, was in Morrison on Tuesday and Wednesday, he having the Morrison Telephone Co. install three instruments with his device for non-listening on a long and heavy loaded line.

This was done Wednesday and the test proves it to do absolutely what is claimed for it, namely: Prevents listening-in on the line; permits many conversations to be carried on over one circuit at the same time.

It gives absolute private service, as it is impossible for any one to listen-in on the lines. It is so simple that it can be used on the present lines and needs no attachments at the central office.

At the recent convention in Chicago, the S. R. system was explained to many interested telephone men. Those who are desirous of obtaining information relative to the system may obtain it by addressing the S-R. Electric Co., 160 North Fifth avenue, Chicago.

Stromberg-Carlson Farmer Line Bulletin.

The Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., has reprinted its farmer line bulletin No. 1,009, and is now issuing copies to all telephone companies on its mailing list.

This bulletin is a handy reference book and buyers' guide for the rural exchange, as it contains practically everything in telephone equipment and accessories necessary for the construction and maintenance of a rural telephone system.

Wall, desk and combination telephone outfits, switching telephones, extension bells, test sets, various types of switchboards, parts for telephones and switchboards, operators' chairs, construction material of all kinds, are a few of the many items described and illustrated.

It is neatly printed on a lightweight paper and the back cover shows a parcel post guide which tells at a glance just what it will cost to have goods shipped by parcel post from either the company's Chicago or Rochester office.

Any telephone company that does not receive a copy of this bulletin in the course of the next few days can secure one by dropping a line to that effect to the company's advertising department at Rochester, N. Y.

Copper Production and Consumption.

In the latest issue of Copper Gossip, published by the National Conduit & Cable Co., are given some facts relating to the production and consumption of copper. Among other things it is said:

"The present absorption of copper is highly favorable to market values of the metal, but it is fortunate for the consuming trade that the aggregate output at producing centers is in sufficient volume to meet the heavy demands of recent months. The movement of copper into consumption is likely to tax from 75 to 100 per cent. of productive capacity if demand keeps up at the recent substantial rate. New developments in 1916 will therefore be watched with intense interest. We are in a period of abnormal conditions, and both consumption and production of copper are bound to increase in the next five years. The remarkable improvement in market prices will undoubtedly greatly stimulate future production throughout the world.

Copper smelting and refining plants are the most complete and extensive ever erected. New methods of treatment have been adopted and important changes introduced, and the beneficial results of changes made are being demonstrated to a notable degree. The proportion of metal saved and the increased total production are important features of new processes in use at the present time. It is also of immediate importance to consumers of copper that large bearing deposits have been successfully developed in Alaska and Chile in recent years. According to estimates by expert authorities, these districts will be capable of furnishing an enormous output of copper. Indications are becoming more pronounced that production will rise to a new level within the next few years, but well informed parties also hold to the belief that the general consumptive demand will also expand to new dimensions during the next decade."

Book Review.

OFFICIAL INDEX TO STATE LEGISLATION; Vol. I. Published by Law Reporting Co., New York. Price $10 to subscribers.

This index furnishes a ready reference to all state legislation, and is corrected and cumulated weekly to include all changes in position and new bills introduced during the week.

The arrangement of the subject index is: (a) By subjects alphabetically. (b) Under each subject, by states, alphabetically. (c) Under each state, the senate first and then the assembly or house. (d) Under each house, the bills first and then the resolutions, numerically, by introduction numbers.

The entry for each bill and resolution gives: (1) The bill number. (2) The date of introduction. (3) The name of the member introducing the bill. (4) The subject. (5) The effect of the proposed legislation or the "short title" of the bill. (6) The position or status of the bill, on the date shown at the head of the column.

The year, until June 1, the index will be cumulated and published weekly. Each new issue will contain everything that previous issues have contained, with changes in position of bills, and new bills introduced subsequent to the previous issue. Weekly supplements will be issued from June 1, until the publication of the complete annual number, about August 1, in which will be shown the status of bills when the legislatures adjourned. After the issue of the complete annual number, weekly cumulative supplements will be issued when any legislature is in regular or special session. The plan of publication is fully explained in the preface.

The subscription to all the weekly numbers and the annual number and supplements for 1916 will be $100, and subscribers for 1916 will be furnished the final 1915 number for $10 additional.

The index is published in co-operation with the state legislative reference departments and libraries represented in the National Association of State Libraries and the American Association of Law Libraries, and under the direction of the joint committee on National Legislative Information Service of those associations.

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years ago and we still have a big future in mind for you as well as for ourselves; so please remember when buying, every one of Cook's products has a big future built right in it before our name goes on — it will mean more to both of us.

Here's a list of our specialties that we would like to sell to you:

- Connectors, for wire sleeves
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- Fuse and Carbon Strips } House Construction
- Fuse Wire
- Guy Clamps
- Intermediate Distributing Frames
- Lightning Arresters
- Line Fuses, all types
- Main Distributing Frames
- Mica Fuses (Cook's type)
- Marlin Cable Hangers
- Messenger Hangers
- Messenger Splices
- Protected Pole Cable Terminals
- Switchboard Protectors
- Subscribers' Station Protectors
- Test Connectors
- Toll Line Arresters
- Unprotected Pole Cable Terminals
- "U" Bolt Clips
- Wall Type Distributing Frames
- Wire Sleeves, steel and copper
- Etc., Etc., Etc.

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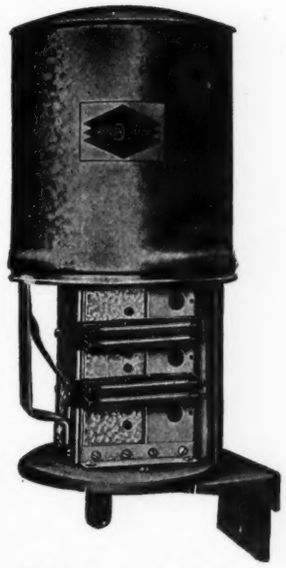

Type S-16
Cover Up

Condensed News Reports

Officers of Companies Are Urgently Requested to Forward to Us Promptly All Financial and Other Statements as Soon as Issued and Any Items of Interest as to Their Plants and Systems

Personal.

GEORGE HENNESS has been elected manager of the Miami County Telephone Co., Paola, Kan., to succeed C. G. Finch, resigned.

A. V. GRIMES, late of Oklahoma, has been made manager of the Eldorado Telephone Co., at Eldorado, Texas, to succeed J. S. Jones, who resigned to engage in ranching.

RUFUS STARKS, manager of the Cumberland Telephone & Telegraph Co., at Milton, Ky., and Miss Anita Givіden, of Sulphur, Ky., were married recently at Louisville.

W. F. GARDNER, for the past four years district plant chief of the Cumberland Telephone & Telegraph Co., with headquarters at Paducah, Ky., has been transferred to Frankfort. He will be succeeded at Paducah by W. G. Adair, of Louisville.

W. E. HATTON, foreman of the Cumberland Telephone & Telegraph Co., at Mt. Sterling, Ky., for a number of years, has been chosen manager of the local exchange to succeed C. T. Chatham, who was recently transferred to Chipley, Fla.

J. H. HALL, of the sales force of the Bell Telephone Co. of Pennsylvania, at Reading, Pa., has been promoted to the position of manager of the Carbondale, Pa., exchange. He succeeds H. E. Ward, who has been appointed sales manager of the Scranton subdistrict.

New Companies and Incorporations.

CARRABELLE, FLA.—Carrabelle Telephone Co. was recently incorporated with a capital stock of $5,000. The incorporators are: W. C. McKissack, president and treasurer; A. M. Lewis, vice-president; M. P. McKissack, secretary.

PATOKA, ILL.—The Patoka Telephone Exchange Co. was incorporated recently with a capital stock of $1,500. The incorporators are T. P. Walker, J. Wardley and R. L. Lambert.

MASON CITY, IA.—Articles of incorporation were filed recently by representatives of the Burchinal & Clear Lake Telephone Co. The officers of the company are: President, Hans Tokle; secretary-treasurer, J. C. Davenport. The members of the board of directors are H. Rich, H. Tokle, Walter Atchison, Frank Ott, E. Long, Ned O'Neil, W. F. Rich and J. C. Davenport.

STOCKTON, IA.—The Stockton & Walcott Independent Telephone Co., a co-operative concern, was organized recently. As outlined in the articles of incorporation, there will be no capital stock. The patrons will mutually own the line and be mutually liable for all dues and cost of maintenance. The officials at the head of the company are designated as follows: President, Henry Dittmer; vice-president, Fritz Kruse; secretary, John G. Vogt; treasurer, Henry P. Broders; trustees, Charles Siebke, James Paustian and Thomas Paper.

WARBA, MINN.—With thirty-two stockholders, the farmers of Warba have organized a rural telephone company. The officers of the company are: W. P. Hicken, president; M. Rosholt, vice-president; R. W. Hawkins, treasurer, and C. A. Butterfield, secretary. The directors are C. A. Martin, A. J. Mosteller and William McCaffery.

AVON, S. D.—The Farmers Union Telephone Co. was recently incorporated with a capital stock of $25,000. The incorporators are P. D. Magnuson, president, Springfield, S. D.; D. L. Wickens, vice-president, Avon, S. D., and J. E. Nelson.

KATY, TEX.—The Katy Telephone Co. has been incorporated with a capital stock of $240. The incorporators are W. C. Stockdick, W. E. Freeman and G. A. Porter.

TRENTON, TEXAS.—Trenton Telephone Co. was incorporated recently with a capital stock of $4,400. The incorporators are J. E. Norman, J. A. Sparkman, J. H. Wilson.

SEATTLE, WASHINGTON.—The Prince William Sound Waterpower Light & Telephone Co., was incorporated recently with a capital stock of $300,000, by Sydney Marshall, B. Pilly, and M. H. Y. Lenior.

TREGO, WIS.—The Trego Telephone Co. was incorporated recently with a capital stock of $5,000. The incorporators are W. A. Porter, A. E. Porter and G. H. Ross all of Trego.

Financial.

ARENAC, MICH.—The Bay Shore Telephone Co.'s capital stock has been increased from $830 to $1,500.

CINCINNATI, OHIO.—The Cincinnati & Suburban Bell Telephone Co. has declared its regular quarterly dividend of 2½ per cent., payable January 3.

MIDDLEBURG, PA.—The directors of the Middlecreek Valley Telephone Co. recently declared an annual dividend of 5 per cent. to be paid to the stockholders February 1, 1916, as shown on the books of the company January 15, 1916.

MONTREAL, CANADA.—The Bell Telephone Co. of Canada has declared a dividend of 2 per cent. for the quarter ending December 31, payable January 15, to stock of record December 31.

Elections.

DIXON, ILL.—Officers of the Dixon Home Telephone Co. were re-elected as follows at the annual directors meeting held recently: President, J. C. Flowers; vice-president, E. N. Howell; treasurer, W. C. Durkes; secretary, C. B. Cheadle; manager, Louis Pitcher.

SCHALLER, IOWA.—At the annual meeting of the Schaller Telephone Co. the following officers were elected for the ensuing year: President, E. C. Merkley; vice-president, Phil E. Walker; secretary and treasurer, W. M. Speaker; general manager, Chas. E. Guernsey.

PAOLA, KAN.—The annual meeting of the Miami County Telephone Co. was held recently. A. E. Shelton was elected president to succeed D. O. Sellers. Edgar Dunham was then unanimously chosen for vice-president. C. F. Berry was elected treasurer. The directorate as now constituted is as follows: J. H. Anderson, Alex Price, O. A. Hinkle, E. C. Dorsey, William Barnes, Dodd Cornwell, B. J. Sheridan, S. C. Ivy, D. O. Sellers, George B. McDaniel, W. J. Fleming, E. B. Hartz, Charles T. Lyon, George L. Robinson and Charles T. Meuser.

RED WING, MINN.—At the annual meeting of the Red Wing Telephone Co. the following officers were elected: President and treasurer, D. M. Neill; vice-president, C. A. Rasmussen; secretary and manager, V. S. Neill.

MADISON, S. D.—At the annual meeting of the Orland Telephone Co. Henry Janssen was elected president; Frank Clark, vice-president; Ed. Erickson, secretary; Winfred State Bank, treasurer.

Miscellaneous.

CHAMPAIGN, ILL.—Arrangements were completed recently by which the stock of Julius Kiper and Herman Kiper of Chicago, who held a controlling interest in the stock of the Home Telephone Co., was acquired by Frank H. Woods of Lincoln, Neb., and Manford Savage, of Champaign, Ill.

CROWN POINT, IND.—The Northwestern Telephone Co. of Crown Point, Ind., has filed a preliminary certificate of dissolution.

LARNED, KANSAS.—Dr. H. E. Lindas, president of the Arkansas Valley Telephone Co., announces that excavations will soon begin for the placing of underground conduits in the business district and in some parts of the residence district.

HUNTINGTON, N. Y.—The New York Telephone Co. has prepared plans for a two-story telephone exchange building, to be built on the plot with about 100 feet front on the south side of Main street, corner of Prospect. It will be a modern fireproof structure of brick and will be set back 10 or 12 feet from the street.

CARTHAGE, MO.—The Home Telephone Co. is considering plans to change its plant to common battery. The estimated cost is $50,000.

OWENSVILLE, MO.—The Owensville Telephone System, formerly owned by W. W. McCurdy, of Owensville, has been sold to E. G. Westrope, of Kansas City, Mo., for $6,300. Mr. Westrope took charge of the property January 1.

CREIGHTON, NEB.—The Camp Dewey Telephone System, with exchanges at Creighton and Niobrara, Neb., has changed its name to the Northern Telephone Co., with general offices at Malmo, Neb. E. C. Hunt is president and general manager of the company.

MEMPHIS, TEXAS.—A. C. Hendricks of Lone Wolf, Okla., has closed a deal with Horace Gooch whereby he becomes owner of the Memphis Telephone Exchange. Improvements and extensions are planned.